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THE INSECT PEST SURVEY
BULLETIN

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INSECT PEST SURVEY BULLETIN

Vol. 18

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No. 1

THE MORE IMPORTANT RECORDS FOR JANUARY AND FEBRUARY

Examinations made in February indicate that grasshopper eggs have passed the winter with but little mortality, according to reports from Illinois, Missouri, and Colorado. Mormon cricket has passed the winter successfully in Montana and Utah. Up to the third week in February, however, no hatching had taken place.

The pale western cutworm was hatching the middle of January in Utah.

Heavy infestation of white grubs on wheat was reported from Oklahoma. These insects are also doing some damage to asparagus in parts of Nebraska.

Damage to rutabagas by the sugar-beet wireworm is reported from California. Apparently the larvae fed throughout the winter months.

Throughout the chinch bug belt from Indiana to Oklahoma the bugs have apparently passed the winter successfully; however, the most critical period is yet to come.

Owing to the mild winter, the alfalfa weevil has been reported as active in the infested parts of California and in parts of Utah.

Reports from New Jersey, Pennsylvania, and Michigan indicate that the codling moth has passed the winter with comparatively low mortality.

Reports from Georgia and Illinois indicate that the San Jose scale came through the winter very successfully. In Georgia examinations made during the first week in February indicate that 83 percent of the scale were still alive. The infestation in this

State, however, is very light.

Although peach trees were blooming the third week in February in Georgia, no plum curculio adults had been taken up to that time.

Green citrus aphids were beginning to appear the third week in February in the orange groves of Florida. In general, they were not nearly so abundant as last year.

The citrus rust mite was abnormally prevalent in both Florida and Louisiana in February.

The vegetable weevil was reported as generally abundant from Florida to Georgia and westward to Louisiana. In many places it was doing serious damage. It has also been recorded, for the second successive year, attacking plants in tobacco seedbeds in Florida.

The banded cucumber beetle was reported throughout the Gulf region and in southern California.

Severe damage to spinach by the western spotted cucumber beetle was reported from southern California.

Entire fields of tomatoes in southern California, wherever the vines have persisted through the winter, are very heavily infested with the larvae of the tomato pinworm.

A similar condition prevailed where pepper plants were allowed to stand, these being heavily infested with the pepper weevil in the same region--southern California.

In western Illinois, cankerworm adults appeared in unusual numbers during the warm weather early in February.

In Arizona the past winter has been one of extremely heavy screwworm infestation.

Buffalo gnats were worrying cattle in Arkansas the last week in December. This is the earliest record for that State.

REPORTERS FOR THE INSECT PEST SURVEY

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GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

Illinois. W. P. Flint (February 24): Grasshopper eggs have survived the weather thus far in very large numbers. Eggs brought to the laboratory have hatched almost 100 percent.

Missouri. L. Haseman (March 1): A recent check on egg masses to determine winter mortality indicates that most of the packets are wintering without serious loss. Some field observations, however, indicate that in wet areas a considerable percentage of egg packets of Melanoplus differentialis Thos. have been soaked, and in such instances winter mortality was rather high. Recent freezing experiments also indicate that in their normal location a considerable percentage of the eggs will withstand air temperatures considerably below zero.

Oklahoma. C. F. Stiles (February 22): Numerous reports have reached the office that grasshopper eggs were hatching in large numbers; however, I have not been able to verify any of these reports and have not found any grasshoppers of the injurious species in the fields.

Montana. H. B. Mills (February 21): Overwintering grasshopper nymphs, probably Chortophaga spp., have been reported from various sections of the State.

Colorado. C. R. Jones (March 1): Eggs of Dissosteira longipennis Thos. are scattered over the southeastern part of the State in El Paso, Pueblo, Lincoln, Crowley, Otero, Las Animas, Custer, Fremont, Huerfano, and Bent Counties. This species entered Colorado from the southern part of the State adjacent to New Mexico and have been migrating by flight toward Nebraska and Wyoming. Last year they were known to fly 175 miles.

MORMON CRICKET (Anabrus simplex Hald.)

Montana. H. B. Mills (February 21): Eggs collected in Yellowstone County in February showed a high percentage of fertility and considerable vigor.

Utah. C. J. Sorenson (February 23): Eggs of Mormon crickets had not hatched in Tooele County by February 12.

CUTWORMS (Noctuidae)

Louisiana. C. O. Eddy (February): Cutworms are active in the trucking area in southern Louisiana.

Utah. C. J. Sorenson (February 23): Eggs of the pale western cutworm (Porosagrotis orthogonia Morr.) were found hatching on January 16 in dry-farm wheatfields west of Lehi, Utha County, in the north-central part of the State. A few specimens of noctuid moths were observed flying early in the evening and a few woolly specimens of undetermined lepidopterous larvae were also observed during this period.

WHITE GRUBS (Phyllophaga spp.)

Nebraska. M. H. Swenk (February 18): An inquiry as to the control of white grubs in asparagus beds in Nance County was received today.

Oklahoma. C. F. Stiles (February 22): Wheat through the main wheat belt of Oklahoma, comprising Kay, Noble, Garfield, Grant, and Alfalfa Counties, is heavily infested with wheat white grubs, P. lanceolata Say. There is another quite serious outbreak in Comanche and Tillman Counties. The unusually warm weather of the first 2 weeks in February caused the grubs to approach the surface of the ground and begin feeding. Recent cold weather has, no doubt, checked this.

WIREWORMS (Elateridae)

Nebraska. M. H. Swenk (February 17): A request for information on the control of wireworms was sent in from Holt County.

California. M. W. Stone (February 8): Adults of the sugarbeet wireworm (Limonius californicus Mann.) were collected on alfalfa near Huntington Beach on January 12. Owing to high soil temperatures in December and January 1937-38, emergence of males and females in laboratory cages occurred on January 24, or 23 days earlier than in 1937. A 3-acre field of rutabagas near Arcadia was damaged by L. californicus larvae to the extent that over 200 sacks were graded unfit for consumption and were sold to a dairy for feed. The combined damage in two fields has now resulted in a loss to the grower of over \$600. Apparently these rutabagas had been attacked continuously throughout the winter, as both old and recent damage was noted. Also, an abundance of wireworms were recovered when the rutabagas were examined today.

CRANE FLIES (Tipulidae)

Louisiana. B. A. Osterberger (February): Many large crane flies have been in flight in the southern part of Louisiana since about February 11. The abundance apparently is governed by the temperature.

COMMON RED SPIDER (Tetranychus telarius (L.))

New York. E. P. Felt (February 25): Generally abundant on apple twigs at Glen Cove, Long Island.

Mississippi. C. Lyle (February 23): Injury on japonica from Escatawpa, Jackson County, on January 4; on japonica from Perkinston, Stone County, on February 8; on magnolia from Buena Vista, Chickasaw County, on February 14; on hedge from Water Valley, Yalobusha County, on February 15; and on azalea from Gulfport, Harrison County, on February 20.

CEREAL AND FORAGE - CROP INSECTS

WHEAT

CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton (February 9): Chinch bugs were observed sluggishly moving around in clumps of Andropogon scoparius and in adjacent grass and plant litter near Lafayette during the warmest part of the day. The air temperature at 11 a.m. was 60° F., and the temperature in clumps where chinch bugs were sluggishly moving was 52°.

Illinois. W. P. Flint (February 24): A number of chinch bug collections have been made during the course of the winter. All show a high percentage of survival.

Oklahoma. C. F. Stiles (February 22): Chinch bugs are on the increase throughout the central and northeastern part of the State, according to a survey completed the first of the year. In most of the counties surveyed there was an increase over the 1936 survey. The most heavily infested counties are Okfuskee, Muskogee, Okmulgee, and Lincoln.

CORN

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

New Jersey. J. B. Schmitt (February 26): Woodpeckers are getting some European corn borers, but most of them are overwintering nicely.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

Utah. G. F. Knowlton (February 23): Adult alfalfa weevils were twice observed to be active during the very mild winter at Logan.

California. A. E. Michelbacher (February 21): Owing to the mild weather, the alfalfa weevil has been active all winter. On January 11, in a field at Pleasanton in which the late fall growth of alfalfa was not cut, an average of 36 adults and 83 larvae were collected per 100 sweeps of an insect net. In a similar field in the San Francisco Bay area an average of 1 adult and 45 larvae were collected. In most fields the counts were much lower than those given above. On February 16 the highest average number of larvae collected for 100 sweeps of a net in the most heavily infested field in the San Joaquin Valley was 106, at Pleasanton 5, and in the San Francisco Bay area 49. In the San Joaquin Valley adults of Bathyplectes curculionis Thoms. were scarce, while in the San Francisco Bay area they were rather abundant.

CLOVER

GREEN CLOVER WORM (Plathypena scabra F.)

Mississippi. C. Lyle (February 23): On January 14 a correspondent at Enterprise, in Clark County, sent in adults with the statement that her house, woodpile, and all out-houses were full of them. J. M. Langston observed their presence around blooming pear trees at Collins, in Covington County, on February 5.

VETCH

PEA APHID (Illinoia pisi Kltb.)

Louisiana. L. O. Ellisor (February): The pea aphid is damaging vetch in the central part of the State.

COWPEAS

COWPEA CURCULIO (Chalcodermus aeneus Boh.)

Virginia. T. L. Bissell (February 9): Hibernating around old cowpea fields in numbers at the Virginia Truck Experiment Station, Prince George County. One specimen of C. collaris Horn was found in hibernation in broom sedge.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

Louisiana. B. A. Osterberger (February): The larvae of the sugarcane borer are found hibernating in abundance in cane stalks, cane tops, old cornstalks, sorghum; Johnson grass, and the crown of rice stubble. (February 24): In splitting stalks of standing sugarcane in Baton Rouge today a pupa was found. This is the first pupa found this year. This cane is on the south side of a building and is fairly well protected.

SUGARCANE BEETLE (Euethola ruficeps (Lec.))

Louisiana. B. A. Osterberger (February): Many adults have been noticed in sugarcane fields following plowing of sugarcane stubble the latter part of February.

F R U I T I N S E C T S

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Pennsylvania. H. E. Hodgkiss (February 26): Observations in Adams County on February 24 indicate that codling moth larvae are abundant. Apparently not many were destroyed during the winter.

New Jersey. J. B. Schmitt (February 26): The lack of a continuous snow blanket this winter has prevented any decrease in the numbers of overwintering larvae by bird feeding.

Michigan. R. Hutson (February 23): Indications are that survival of larvae is about as usual. There has been no particularly cold weather and in some of the more heavily infested districts the bases of the trees have been covered with snow.

EASTERN TENT CATERPILLAR (Malacosoma americana F.)

Vermont. H. L. Bailey (February 24): Egg masses generally less abundant than for the past 3 years in Bennington, Rutland, and Windsor Counties in southern Vermont.

Pennsylvania. H. E. Hodgkiss (February 26): Eggs are said to be very abundant in the western counties.

Florida. J. R. Watson (February 25): S. O. Hill, at Monticello, reports the first appearance of M. americana in the region, on February 12, feeding on the wild crab apples. Also abundant in the Gainesville section, feeding on wild plums and other trees.

Mississippi. C. Lyle (February 23): Peach twigs containing eggs were received in January from Yazoo City, and twigs containing eggs and young larvae were received on February 11 from Pachuta, in Clark County.

APHIDS (Aphididae)

Pennsylvania. H. E. Hodgkiss (February 26): Aphid eggs are abundant throughout southeastern Pennsylvania and counts of large numbers of buds indicate an average of five eggs to each bud.

Mississippi. C. Lyle (February 7): Apple twigs showing a light infestation of Eriosoma lanigerum Hausm. were received from Lyon, in Coahoma County, today.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Vermont. H. L. Bailey (February 24): Only a few live insects were found in the principal area of infestation in the State, namely, Brattleboro, Windham County, in southeastern Vermont.

Illinois. W. P. Flint (February 24): Counts from southern Illinois show a very high survival. Examinations from a few orchards in western Illinois show 15 percent of the scale alive.

South Carolina. F. Sherman (February): Growers in the western part of the State report that this scale is less common this winter than it was a few years ago. Complaints are coming principally from the central part of the State.

Georgia. O. I. Snapp (February 21): Although the infestation is very light in the Fort Valley peach district, 85.2 percent of the scales were alive on December 29, and 83.5 percent on February 8.

Missouri. L. Hasegan (March 1): Here at Columbia winter mortality of San Jose scale is low, judging by recent examinations.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Nebraska. M. H. Swenk (February 20): Reports of damage to trees, especially elm, maple, oak, and hackberry, were received from Douglas, Lancaster, Gage, Madison, Nance, Greeley, Lincoln, and Deuel Counties during the period October 20 to February 20.

Mississippi. C. Lyle (February 23): C. femorata has been reported recently from Tupelo, in Lee County, and Decatur, in Newton County.

EUROPEAN RED MITE (Paratetranychus pilosus G. & F.)

Pennsylvania. H. E. Hodgkiss (February 28): Eggs are more abundant in the southeastern counties than they have been for 2 or 3 years. In the northwestern counties the eggs are scattered.

PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Mississippi. C. Lyle (February 23): Peach twigs, evidently injured last fall by larvae, have been received recently from Covington, Sunflower, and Tishomingo Counties.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Georgia. O. I. Snapp (February 19): Although peach trees are blooming and wild plum bushes are in full bloom in Fort Valley, no plum curculio adults have been taken to date by jarring these trees and bushes.

BLACK PEACH APHID (Anuraphis persicae-niger Smith)

California. A. E. Michelbacher (February 21): The black peach aphid has been observed throughout the winter at Berkeley on peach and Japanese hybrid plums. It occurs on these hosts throughout the summer.

TERRAPIN SCALE (Lecanium nigrofasciatum Perg.)

Pennsylvania. H. E. Hodgkiss (February 26): The terrapin scale continues to be very abundant on peaches in Adams and Franklin Counties, where it has always been a menace.

CITRUS

GREEN CITRUS APHID (Aphis spiraeicola Patch)

Florida. J. R. Watson (February 25): Citrus aphids are beginning to appear in orange groves where the new growth is well along, but they are not nearly so abundant as last year. The Chinese ladybeetle (Leis sp.) is in evidence in Orange County, feeding on these aphids.

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. C. D. Lebert (January 20): Eleven infested trees were found on a 17-acre property in Phoenix which formerly had an infestation in ornamentals.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (February 25): Rust mites are rather prevalent for this time of the year, owing to unusually warm weather during most of February.

Louisiana. I. J. Becnel (February): Silver rust mites have been common on citrus trees throughout the winter. Most of the second crop oranges were heavily infested.

CITRUS RED MITE (Paratetranychus citri McG.)

Louisiana. I. J. Becnel (February): Several heavy red spider infestations have been found recently in the citrus section.

PAPAYA

A PYRALID (Homalopalpia dalera Dyar)

Florida. J. R. Watson (February 25): H. dalera was reported as destructive to the papaya fruits in Dade County.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Florida. F. S. Chamberlin (February 9): Larvae of the vegetable weevil are quite abundant in gardens at Quincy, Gadsden County.

Georgia. M. M. High (February 21): The vegetable weevil is doing serious damage to turnips and onions in Thomas County. The

weevil was reported from Donalsonville, southwestern Georgia, on February 15, as doing "quite a little damage," crop not specified. Grubs are present at Experiment on turnip and on a weed, probably Leptilon, in a rather bare field.

Mississippi. C. Lyle (February 23): Complaints, accompanied by specimens, of larval injury to cabbage, turnips, and other crops have been received during the last 2 months from Heidelberg, in Jasper County; Scobey, in Yalobusha County; Hattiesburg, in Forrest County; Osyka, in Pike County; and Noxapater, in Winston County.

Louisiana. C. O. Eddy (February): The vegetable weevil has been very destructive throughout the winter in all parts of Louisiana.

BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

Georgia. M. M. High (February 20): D. balteata is doing considerable injury to vegetables in Thomas County.

Florida. J. R. Watson (February 25): This beetle is common on truck crops over the State but no severe damage has been reported.

Mississippi. C. Lyle (November 10): D. balteata was found feeding on the blossoms of late-blooming flowers at Fayette, in Jefferson County.

Louisiana. B. A. Osterberger (February): Present on winter cover crops and in flight, along with the spotted cucumber beetle, on the warmer days in February.

California. J. C. Elmore (January 19): D. balteata was quite numerous on black nightshade (Solanum nigrum) near Bolsa, in Orange County. This species has been observed in unusual numbers in several localities during the fall and winter months.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

South Carolina. F. Sherman (February): Beetles observed in flight at Clemson late in February.

Georgia. O. I. Snapp (February 15): Numbers of these beetles have appeared from hibernation and many are on wild plum bushes and peach trees at Fort Valley, feeding on the open blooms.

Mississippi. C. Lyle (February 23): Adults were reported on February 17 to be severely injuring young cabbage plants at Tylertown. These beetles were also reported as feeding on the blossoms of late-blooming flowers at Fayette, in Jefferson County, on November 10, 1937.

Louisiana. B. A. Osterberger (February): On the warmer days in February, when the temperatures were up to a maximum of 82° F., many adults were noticed on winter cover crops.

WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

California. R. E. Campbell (January 22): About 200 acres of spinach in the San Fernando Valley, Los Angeles County, planted late in September, was very heavily infested. About 300 acres of spinach planted in October in Hemet Valley, Riverside County, was damaged and treated. Only a few Diabrotica present, but evidence of damage shows in the older leaves.

SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

Virginia. H. G. Walker and L. D. Anderson (February 25): Adults of the seed corn maggot have been active in the field at Norfolk on warm days during February.

MOLE CRICKETS (Gryllidae)

Florida. F. S. Chamberlin (February 14): Mole crickets, Scapteriscus sp., are causing slight damage in the tobacco plant beds of Gadsden County.

Mississippi. C. Lyle (February 23): A complaint of severe damage by mole crickets was received on January 3 from a correspondent at Gautier, in Jackson County. No specimens accompanied this complaint.

Louisiana. C. O. Eddy (February): Numerous reports of mole crickets have been received from southern Louisiana during the last 3 months.

POTATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Virginia. H. T. Cook and T. J. Nugent (February 22): Several Colorado potato beetles were observed crawling about in a protected place near Cradock, Norfolk County.

TOMATO

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

California. J. C. Elmore (January 19): The tomato pinworm has survived in southern California in unusually large numbers because of the mild winter weather. In many localities, tomato vines are fresh and green and are heavily infested.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

New Jersey. J. B. Schmitt (February 26): In South Jersey Mexican bean beetles are hibernating successfully in moderate numbers.

CABBAGE

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Virginia. H. G. Walker and L. D. Anderson (February 25): Larvae of the diamondback moth have been rather scarce all winter at Norfolk. From about 40 to 50 percent of those present have been parasitized.

CUCUMBERS

GARDEN FLEA HOPPER (Halticus citri Ashm.)

Indiana. J. J. Davis (February 18): The garden flea hopper at Terre Haute is reported as very destructive to cucumbers in greenhouses.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

New Jersey. J. B. Schmitt (February 26): Asparagus beetles are plentiful under the bark of trees around old asparagus beds.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Louisiana. C. O. Eddy (February): The turnip aphid has been abundant.

FALSE CHINCH BUG (Nysius ericae Schill.)

Mississippi. C. Lyle (February 23): Specimens were received from Meridian, in Lauderdale County, on November 6; from Lexington, in Holmes County, on November 30; and from Sumrall, in Lamar County, on December 2, each report stating that turnips had been rather severely damaged.

CELERY

CARROT WEEVIL (Listronotus latiusculus Boh.)

New Jersey. J. B. Schmitt (February 26): Late celery was badly infested last fall by the parsley stalk weevil, especially in Bergen County. A large number are hibernating in the sod strips along ditch banks of the celery fields.

SPINACH

GREEN PEACH APHID (Myzus persicae Sulz.)

Virginia. H. G. Walker and L. D. Anderson (February 25): Spinach aphids are rather scarce on spinach and collards at Norfolk and many of those present appear to be infected with a fungus disease.

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas formicarius F.)

Mississippi. C. Lyle (February 23): Specimens were found in Walthall County on November 2 for the first time.

STRAWBERRY

APHIDS (Aphidae)

Virginia. H. G. Walker and L. D. Anderson (February 14): From 25 to 50 percent of the eggs of the strawberry root aphid (Aphis forbesi Weed) in strawberry fields at Norfolk are hatching on this date.

Louisiana. C. O. Eddy (February): Aphids are abundant on strawberry in eastern Louisiana.

COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker and L. D. Anderson (February 25): Red spiders are moderately abundant in many fields of strawberries

and will undoubtedly cause considerable damage if not controlled.

Louisiana. C. O. Eddy (February): Red spider abundant on strawberry in eastern Louisiana.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (February 25): In only one pepper patch in Manatee County was the pepper weevil found this year.

California. A. F. Howland (January 19): The pepper weevil was observed in abnormally large numbers on nightshade and surviving pepper plants in Los Angeles and Orange Counties. Mild winter temperatures have permitted nightshade to survive in abundance wherever it has not been destroyed as a pepper weevil control measure.

TOBACCO

HORNWORMS (Protoparce spp.)

New Jersey. J. B. Schmitt (February 26): Last fall New Jersey had a very heavy outbreak of tomato hornworms, which entered the soil and appear to have overwintered successfully.

TOBACCO FLEA BEETLE (Epitrix parvula F.)

Florida. F. S. Chamberlin (February 24): Tobacco plant beds in Gadsden County are only slightly infested with flea beetles. No damage of commercial importance has been observed this season.

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Florida. F. S. Chamberlin (March 4): Small larvae have been found feeding in several tobacco plant beds in Gadsden County. Only light damage has resulted.

F O R E S T A N D S H A D E - T R E E I N S E C T S

CANKERWORMS (*Geometridae*)

Illinois. W. P. Flint (February 24): Very warm weather during the early part of February caused large numbers of adults to appear in the western part of the State. Male moths were noted on store windows in towns along the Illinois River and at Carlinville, in the southwest-central part of the State.

FOREST TENT CATERPILLAR (*Malacosoma disstria* Hbn.)

Vermont. H. L. Bailey (February 24): Egg masses abundant on sugar maples and, to lesser extent, on other trees in sections of Windsor, Addison, Bennington, and Rutland Counties, southern Vermont, where outbreaks have been heavy in the last 2 or 3 years. Egg masses average small.

ASH

CARPENTER WORM (*Prionoxystus robiniae* Peck)

Nebraska. M. H. Swenk (February 20): Ash trees in Hamilton and Custer Counties were reported to be infested with the carpenter worm on October 27 and December 11. Specimens were also sent in from Greeley and Nuckolls County on January 28 and February 8.

ELM

EUROPEAN ELM SCALE (*Gossyparia scabra* Mod.)

Michigan. Ray Hutson (February 23): Has been reported from Lansing, Detroit, and Grand Rapids.

Nebraska. M. H. Swenk (February 20): Several inquiries concerning the control of the European elm scale, now threatening trouble for next year, were received in January and February from Lincoln County.

HACKBERRY

HACKBERRY NIPPLE GALL (*Pachypsylla celtidis-nana* Riley)

Nebraska. M. H. Swenk, (February 20): From Wheeler County on October 25 came specimens of hackberry leaves affected by the hackberry nipple gall.

LOCUST

A SCALE INSECT (Lecaniodiaspis sp.)

Pennsylvania. E. P. Felt (February 25): Found in considerable numbers on locust trees at York, Pa.

OAK

GOUTY OAK GALL (Andricus punctatus Bass.)

Connecticut. E. P. Felt (February 25): The gouty oak gall was extremely abundant on oak at Ridgefield.

OAK CLUB GALL (Andricus clavulus O. S.)

New England and New York. E. P. Felt (February 25): This insect is somewhat numerous around Boston, Mass., in southwestern Connecticut, and near Westbury, Long Island, N. Y.

GOLDEN OAK SCALE (Asterolecanium variolosum Retz.)

New York. E. P. Felt (February 25): Golden oak scale was found abundantly on a European oak on the borders of New York City.

PINE

PINE TUBE MOTH (Argyrotaenia pinatubana Kearf.)

Connecticut and Massachusetts. E. P. Felt (February 25): The pine tube builder is somewhat abundant locally at Darien, Conn., and is reported as injurious around Boston, Mass.

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

Connecticut. E. P. Felt (February 25): Has become somewhat abundant at Darien, there being a marked increase since the cold winter of 1933-34.

PITCH-MASS BORER (Parharmonia pini Kellicott)

New York. E. P. Felt (February 25): Somewhat prevalent on Austrian pine at White Plains.

SCOTCH PINE WEEVIL (Hylobius radicis Buchanan)

New England. E. P. Felt (February 25): The Scotch pine weevil has been somewhat injurious to Scotch Pine at Bedford, N. Y..

It has also occurred here and there in southwestern New England.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

New England. E. P. Felt (February 25): This pest was locally abundant on Long Island, and in Westchester County, N. Y., and also in southwestern New England, on mugho and Austrian pine, in particular.

Colorado. G. M. List (February 23): Indications from Fort Collins are that the pine leaf scale deposited fewer eggs last fall than normally. Larvae of the lady beetle Stethorus punctum Lec. were found on all samples. In one instance the eggs beneath 30.5 percent of the scales had been destroyed. The eggs had been destroyed under 9.2 percent of all scales examined.

Utah. G. F. Knowlton (February 23): Many ornamental and some forest pine and spruce in Cache County have been heavily infested with pine needle scale.

PLANETREE

TERRAPIN SCALE (Lecanium nigrofasciatum Perg.)

New York and Connecticut. E. P. Felt (February 25): This scale was found in considerable numbers on a London planetree on the edge of New York City, and was also numerous on red maple at Simsbury, Conn.

POPLAR

POPLAR BORER (Saperda calcarata Say)

Nebraska. M. H. Swenk (February 20): The poplar borer was found infesting poplar trees in Antelope County on October 29.

SPRUCE

GALL APHIDS (Chermes spp.)

New England and New York. E. P. Felt (February 25): The spruce gall aphid (C. abietis L.) is somewhat prevalent on Norway spruce in southern New England and southeastern New York.

Colorado. C. R. Jones (March 1): Silver Colorado spruce trees in the vicinity of Fort Collins are heavily infested by a species of Chermes.

INSECTS AFFECTING GREENHOUSE
AND ORNAMENTAL PLANTS

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Mississippi. C. Lyle (February 23): On December 29 a correspondent at Hattiesburg reported that Nandina and rose bushes on her property were infested.

Arizona. C. D. Lebert (February): A small infestation of the cottony-cushion scale was found on Pittosporum tobira in a nursery at Phoenix, some of the plants being heavily infested. All stages of the insect were present.

MEALYBUGS (Pseudococcus spp.)

Nebraska. M. H. Swenk (February 20): Mealybugs were reported to be infesting a fern in Custer County on December 1.

Utah. G. F. Knowlton (February 23): Complaints of mealybug injury to household ornamental plants have recently been received from Roosevelt, Salt Lake City, Brigham, and Logan.

A FIRE ANT (Solenopsis xyloni McCook)

Mississippi. C. Lyle (February 23): On February 15 a correspondent at Dorsey in Itawamba County reported that ants were ruining his hotbed, and a correspondent at Crawford, in Lowndes County, reported that they were abundant around her violets, roses, and other ornamentals. From descriptions, S. xyloni was evidently the species present in each case.

THRIPS (Thysanoptera)

Virginia. H. G. Walker and L. D. Anderson (February 25): Thrips are rather abundant and are causing considerable damage in a greenhouse near Norfolk.

FICKLE MIDGE (Sciara inconstans Fitch)

Nebraska. M. H. Swenk (February 20): This insect was bothering house plants in Sheridan County on December 6 and in Hooker County on January 6.

AMARYLLIS

LESSER BULB FLY (Eumerus tuberculatus Rond.)

New York. E. P. Felt (February 25): Found on Lycoris bulbs in Locust Valley, Long Island.

ARBORVITAE

ARBORVITAE APHID (Lachnus thujafilina Del G.)

Louisiana. B. A. Osterberger (February): Early in February large brown aphids were noticed feeding on the backs of branches of arborvitae. This aphid is easily found by observing activity of wasps and flies around arborvitae trees. Both wasps and flies feed on the secretion from these aphids.

CAMELLIA

SCALE INSECTS (Coccidae)

Mississippi. C. Lyle (February 23): On November 23 H. Gladney sent to this office Camellia japonica leaves infested with Chrysomphalus aonidum L. collected at Ocean Springs, in Jackson County. N. D. Peets found this scale on a rubber plant at Brookhaven on December 1. C. japonica leaves infested with Parlatoria pergandii camelliae Comst. were received on December 9 from Centreville in Wilkinson County. Correspondents in Lincoln, Stone, Jackson, Monroe, and Rankin Counties have recently sent C. japonica leaves showing infestations of Lepidosaphes camelliae Hoke. In February, C. japonica leaves showing infestations of Fiorinia theae Green have been received from correspondents in Monroe and Jones Counties.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Florida. J. R. Watson (February 25): The gladiolus thrips is beginning to be quite destructive in many gladiolus plantations in Manatee and Lee Counties.

HOLLY

A CHERMID (Paurocephala ilecis Ashm.)

Mississippi. C. Lyle (February 23): Chermids, identified by

P. W. Oman as P. ilecis, were collected from Ilex vomitoria on Cat Island and from Gulfport in January.

IVY

OLEANDER SCALE (Aspidiotus hederæ Vallot)

New England. E. P. Felt (February 25): Ivy scale is locally numerous in the southwestern part.

CEDAR

DEODAR WEEVIL (Pissodes nemorensis Germ.)

Mississippi. C. Lyle (February 23): Adults were received on February 23 from Brookhaven, in Lincoln County, with a report that they were abundant on Cedrus deodara. Inspector D. W. Grimes reported the adults of this species abundant on C. deodara at Kosciusko the latter part of November and early in December.

LAUREL

A SCALE INSECT (Cerococcus sp.)

Pennsylvania. E. P. Felt (February 25): Cerococcus, an undescribed species, was found in numbers on a few laurel plants at Haverford.

PALM

LATANIA SCALE (Aspidiotus lataniae Sign.)

Mississippi. C. Lyle (February 23): A palm leaf infested with Latania scale was received from Meridian, in Lauderdale County, on November 13.

A SCALE INSECT (Diaspis boisduvalii Sign.)

Mississippi. M. L. Grimes (February 23): In Meridian palm leaves were infested on November 13.

RHODODENDRON

RHODODENDRON LACEBUG (Stephanitis rhododendri Horv.)

New York and New England. E. P. Felt (February 25): Eggs are locally abundant in Westchester County, N. Y., and in southwestern New England.

SNAPDRAGON

CYCLAMEN MITE (Tarsonemus pallidus Banks)

New York. E. P. Felt (February 25): This mite was found injuring snapdragon at East Rochester, N. Y.

I N S E C T S A T T A C K I N G M A N A N D
D O M E S T I C A N I M A L S

MAN

MOSQUITOES (Culicinae)

Arizona. C. C. Deonier (February 25): Theobaldia inornata (Will.), Anopheles punctipennis (Say), and Culex tarsalis Coq. were present in moderate numbers in Douglas and Dunlap Counties on December 2 and 3, 1937.

TROPICAL RAT MITE (Liponyssus bacoti Hirst.)

District of Columbia. F. C. Bishopp (March 2): This mite was brought into this office, having been collected in an apartment house in Washington, where mice are present in the walls. (Det. by H. E. Ewing.)

Mississippi. C. Lyle (February 23): Specimens collected in a house at Hattiesburg were received in January.

CATTLE

SCREWWORM (Cochliomyia americana C. & P.)

Arizona. C. C. Deonier (February 17): A ranchman reported from Gadsden in southwestern Arizona on February 17 that this is the worst year for screwworms he has ever had. A large cattle company reports that screwworms have caused less trouble during the last week or 10 days, owing to cooler weather. It was also reported on February 17 that wound collections made from four sheep showed that three of them were infested.

HORN FLY (Haematobia irritans L.)

Florida. A. L. Brody (December 29): The horn fly population on livestock at the Federal experiment station at Brooksville was comparatively low, but on practically every animal areas

were observed at the base of the tail where the skin was roughened and the hair lost because of attack by these flies.

Texas. E. W. Laake (February 25): The first horn fly, a female, emerged in a cage on the afternoon of February 7 and three horn flies were caught in the cattle-fly trap located at the laboratory in Dallas during the week. On February 15 five horn flies were seen on one of the cows at the laboratory--the greatest number observed on any animal this season.

STABLE FLY. (Stomoxys calcitrans L.)

Texas. W. G. Bruce (February 25): Stableflies are quite abundant in Dallas, probably more so than during the same season in other years. In one cattle-fly trap 509 were caught during the week.

OX WARBLER (Hypoderma sp.)

Missouri. L. Haseman (March 1): This winter ox warblers were slower than usual in making their appearance under the hide on the backs of animals. In some animals they did not begin to appear until late in January, whereas in many years we get a considerable sprinkle of them on the backs of animals by Christmas. They are less abundant than usual.

BUFFALO GNATS (Eusimulium spp.)

Arkansas. H. H. Schwardt (December 27): Gnats, E. pecuarum Riley, were abundant enough to worry livestock in Miller County the last week in December, the earliest date in our records.

Arizona. C. C. Deonier (February 25): On December 3, 1937, several females of E. griseum Coq. were active in the neighborhood of Coolidge Dam.

LONG-NOSED CATTLE LOUSE (Linognathus vituli L.)

Michigan. R. Hutson (February 23): Blue cattle lice have been reported from Corunna, Breckenridge, and De Witt on this date.

Texas. O. G. Babcock (February 7): Young calves, very lousy, in some cases severely infested at Sonora, western Texas.

(March 2): An unusually heavy infestation of blue cattle lice in western Texas in February.

SHORT-NOSED CATTLE LOUSE (Haematopinus eurysternus Nitz.)

Nebraska. M. H. Swenk (February 20): Sucking lice, believed to be H. eurysternus, were reported to be infesting cattle in Thayer County on January 7.

SHEEP

SHEEP TICK (Melophagus ovinus L.)

Arizona. C. C. Deonier (February 25): The last of January sheep ticks on some of the sheep at Tempe numbered 1 per square inch along the sides, shoulders, and rump.

BLACK BLOWFLY (Phormia regina Meig.)

Arizona. C. C. Deonier (February 25): A ranchman reported on February 16 almost 100 cases at Roll in southwestern Arizona during the winter. Infestation occurred up until shearing time, about a week ago. This man has 3,400 head of sheep on pasture. (February 17): Wound collections were made from four sheep, showing three infested.

SHEEP BITING-LOUSE (Bovicola ovis L.)

Arizona. C. C. Deonier (February 25): During the latter part of January the band of sheep at Tempe, from which specimens of this insect were collected, were reported to have been heavily infested with lice last fall and rubbed off most of their wool along the fences. Several head of the animals were examined, but no appreciable infestation was found.

DOG

SUCKING DOG LOUSE (Linognathus piliferus Burm.)

Nebraska. M. H. Swenk (February 20): Sucking live were reported to be infesting a dog in Lancaster County on November 20.

BROWN DOG TICK (Rhipicephalus sanguineus Latr.)

New York. F. C. Bishopp (February 25): Living specimens were found on vacant property at Jamaica on February 14.

Michigan. E. I. McDaniel (March 1): Specimens were taken from house dogs at Grand Rapids. This tick is rather unusual in Michigan, particularly at this time of year. (Det. by F. C. Bishopp.)

Texas. Grady Kinsolving, Publisher of Corpus Christi Caller-Times (March 3): "For the last several months this newspaper has received an unusually large number of complaints from residents of this city regarding what appears to be an unprecedented epidemic of ticks, which are found not only out-of-doors and in outhouses but very frequently inside residences. These ticks are of various varieties, the most prolific of which apparently is the common red wood tick. All of them apparently are voracious feeders on pet livestock."

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

Illinois. W. P. Flint (February 24): First reports of termites swarming were received at Urbana on this date.

Mississippi. C. Lyle (February 23): Complaints regarding injury from termites have been received during the last few months from all sections of the State.

Nebraska. M. H. Swenk (February 20): R. tibialis Banks was the subject of inquiries received from Douglas, Dixon, and Dawson Counties from October 21 to January 13.

Utah. G. F. Knowlton (February 23): Termite damage in a home was reported from Farmington and Brigham on this date.

ANTS (Formicidae)

Nebraska. M. H. Swenk (February 20): During the first 3 weeks of January several complaints of annoyance caused by Lasius interjectus Mayr in basements came from Richardson, Douglas, Lancaster, and Buffalo Counties.

Utah. G. F. Knowlton (February 4): Ants are causing annoyance to workers, and are invading food-products storage rooms in one factory at Logan.

BOXELDER BUG (Leptocoris trivittatus Say)

Missouri. L. Haseman (March 1): We are already beginning to get complaints regarding the boxelder bugs moving out from their winter harbors in and around buildings.

Nebraska. M. H. Swenk (February 20): Complaints of annoyance by boxelder bugs came from Douglas, Otoe, Lancaster, Buffalo, and Phelps Counties from October 20 to February 20.

Utah. G. F. Knowlton (February 21): A very mild winter has permitted boxelder bug annoyance in homes and schoolhouses during most of the winter.

BEAN WEEVIL (Acanthoscelides obtectus Say)

New York. R. W. Leiby (February 25): At least the average number of complaints that the bean weevil is infesting stored beans is being received from western New York.

Michigan. R. Hutson (February 23): Bean weevils have been reported during the last month from Clarkston, Hamtramck, and Detroit in small lots of beans held for seed.

SAW-TOOTHED GRAIN BEETLE (Oryzaephilus surinamensis L.)

Nebraska. M. H. Swenk (February 20): This beetle was found infesting a cupboard in Saunders County on February 1.

Utah. G. F. Knowlton (February 23): These beetles were found in rice and one in a wrapped package of cup cakes purchased at Logan.

A FURNITURE BEETLE (Anobium punctatum Deg.)

New Hampshire. E. P. Felt (February 25): A furniture beetle was reported as seriously injuring pine flooring at Peterboro on this date.

A TINEID MOTH (Monopis crocicapitella Clem.)

Washington. M. H. Hatch (January 21): Large numbers of adults appeared in September 1937 in the living rooms of a house in Seattle making a considerable nuisance of themselves. Investigation showed they were breeding in an unfinished portion of the basement.

BLUEBOTTLE FLY (Calliphora erythrocephala Meig.)

Mississippi. C. Lyle (February 23): H. Gladney, of Ocean Springs, reported on December 17 that adults of C. erythrocephala were very abundant in three homes at that place. Larvae were very abundant in a shipment of beef bungs originating at Kansas City, Mo., when received by a packing company at Hattiesburg,

although the material was in a sealed, paraffin-lined barrel containing concentrated salt brine.

CLUSTER FLY (Pollenia rudis F.)

New York. R. W. Leiby (February 25): The usual number of complaints are being received that this insect is hibernating in houses.

AN ORTALID FLY (Chrysomya demandata F.)

Nebraska. M. H. Swenk (February 20): Maggots were numerous in the upper stratum of silage in a trench silo in Cedar County early in January.

A FRUIT FLY (Drosophila sp.)

Oregon. H. H. Stage (January 21): During the last 60 days an unusual number of reports have come in telling of nuisance from these insects. They have been reported from many homes, kitchens, and a few soda fountains, and the writer has seen them hovering over his dining table in a restaurant in Portland.

DRONE FLY (Eristalis tenax L.)

Nebraska. M. H. Swenk (February 20): The fly was reported as infesting decayed areas in a soft-maple tree in Kearney County on February 4.

NOTES FROM EGYPT

By A. H. Rosenfeld

The entomological section of the Ministry has reported that last summer (1937) the well-known citrus scale, Parlatoria zizyphi Sign., was found for the first time in Egypt on mandarins along the Aboukir Road, Alexandria. Inspection of citrus trees around Port Said, Ismailia, Suez, and Damietta revealed no infestations with this coccid. In Alexandria infestation was apparently restricted to the area on the Ramleh line lying between the suburbs of Sidi Gaber and San Stefano, including the main Aboukir Road, Flemming, and Rushdi Pasha. Another note on a coccid is that Chrysomphalus personatus Comst., not hitherto reported outside of Alexandria, was reported from Damietta.

**THE INSECT PEST SURVEY
BULLETIN**

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**BUREAU OF
ENTOMOLOGY AND PLANT QUARANTINE
UNITED STATES
DEPARTMENT OF AGRICULTURE
AND
THE STATE ENTOMOLOGICAL
AGENCIES COOPERATING**

ALFALFA WEEVIL SURVEY, FALL OF 1937

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Bureau of Entomology and Plant Quarantine

U. S. Department of Agriculture

PURPOSE OF SURVEY

Annual surveys of alfalfa weevil^{2/} abundance in the fall of the year were begun in 1932 in order to indicate the outlook for weevil damage in the following year and to create a reliable record of regional abundance which might later be useful for studying the effects of climate upon the weevil. The surveys also reveal the gross abundance of cocoons of the larval parasite Bathyplectes curculionis (Thoms.)^{3/} and, by dissection, the number of these that are viable. As the survey results are of immediate practical value to entomologists and county agents in a large part of the weevil-infested region, the policy of publishing them was begun with the results of the 1936 survey.^{4/}

^{1/}The work on which this report is based was carried out under the direction of J. C. Hamlin. The survey in Jackson County, Oreg., was planned and executed by R. C. Newton. General assistance was provided by L. J. Jones and J. B. Duncan.

^{2/}Hypera postica (Gyll.).

^{3/}All later mention of parasites in this paper has reference to this species.

^{4/}McDuffie, W. C., Alfalfa Weevil Survey, Fall of 1936. U. S. Dept. Agr., Bur. Ent. and Plant Quar., Insect Pest Surv. Bul. 17: 29-42, March 15, 1937.

EXTENT OF SURVEY

As in 1936, the districts surveyed were restricted to those considered most important in regard to alfalfa culture and weevil damage. Twelve districts were sampled, and these included portions of Oregon, Idaho, Utah, Colorado, Nevada, and Nebraska.

METHODS

The sampling plan was the same as that followed in 1936, 4 representative square-foot samples being taken from each of 25 fields in a district, except in the smaller districts, where 12 fields were considered sufficient. Such sampling does not give highly accurate estimates for individual fields but provides a useful indication of the general level of weevil abundance in a district.

Each sample was taken by forcing into the soil a metal die 1 foot square and removing all alfalfa crowns, litter, and weeds enclosed by the die, as well as the soil from the enclosed area to a depth of from 1 to 2 inches. Later, each sample was reduced in volume by washing, so that its content of weevils, parasite cocoons, and litter remained in the lower of two screen-bottom tubs. These washed samples were individually wrapped in absorbent-paper towels to remove excess moisture and were examined in the laboratory on a white porcelain tray.

LIMITATIONS ON USE OF DATA

Obviously no forecast of weevil damage (or parasite effectiveness) can be exact. Nevertheless it is believed that considerable loss can be averted if interested State entomological workers and county agricultural agents will watch developments in those localities in which the survey has indicated a prospect of important damage by the alfalfa weevil. Our interpretation of survey data is based on the generality that an average population of two adult weevils per square foot is necessary to produce economic damage in most of the older weevil-infested territory. However, the outlook gained from surveys made in the fall is subject to modification by mortality of adult weevils during the winter. Also, the amount of damage in any locality depends on whether spring weather favors or hinders weevil development. Again, certain field conditions manifested by thin stands or poor growth may aggravate the damage in any field or in any district where these conditions prevail, because fewer adult weevils are required to create a larval concentration sufficient to cause damage. Finally, injury in any field populated by a menacing number of larvae is increased by delay in harvesting after the plants are mature. Such maturity is indicated by budding of the top crop, together with scattered blossoms and appearance of the earliest basal shoots of the succeeding crop.

RESULTS

Results of the 1937 fall survey are grouped by States and tabulated by districts, each tabulation being accompanied by a brief discussion. All averages in the succeeding tabulations have reference to areas of 1 square foot. It has also been considered helpful to include a brief summary of the extent of weevil damage which occurred in each State during the growing season of 1937.

OREGON

First-crop damage by the alfalfa weevil in 1937 amounted to 10 and 35 percent, respectively, of fields in Jackson County and in Eagle Valley, Baker County. Economic loss, however, was slight in both areas, larval feeding being largely restricted to the tips of alfalfa plants. In Eagle Valley (table 1) one-sixth of the alfalfa fields surveyed were populated by a menacing number of weevils. Additional injury may develop in hillside fields occupied by smaller weevil populations, because of poor growth and thin stands, as was the case in 1937.

Ordinarily the parasite population would be effective in minimizing production of the new-generation adult weevils, which will form the basis of attack in 1939, but the late-cutting practice prevalent in this area largely nullifies the beneficial effects of parasitization.

Table 1.--Survey results, Eagle Valley, Baker County, Oreg.,
sampled September 29, 1937

Field No.	:	H. postica adults	:	B. curculionis cocoons	
				Present	Viable
		Number		Number	Number
1 - - - - -	:	1.00	:	3.50	1.00
2 - - - - -	:	.75	:	11.25	.75
3 - - - - -	:	1.25	:	7.00	1.50
4 - - - - -	:	1.00	:	7.00	.75
5 - - - - -	:	2.25	:	2.25	.25
6 - - - - -	:	1.25	:	1.25	.50
7 - - - - -	:	.75	:	3.75	1.75
8 - - - - -	:	1.75	:	2.25	.75
9 - - - - -	:	2.75	:	13.00	4.25
10 - - - - -	:	0	:	8.75	1.75
11 - - - - -	:	1.75	:	2.75	.50
12 - - - - -	:	0	:	2.75	.50
Average -	:	1.21	:	5.46	1.19

Malheur County was omitted from the 1937 fall survey, two seasons' study having shown no appreciable differences between alfalfa weevil conditions in this county and in Canyon County, Idaho. The latter county is typical of the lower Snake River Valley of western Idaho and eastern Oregon, and survey results for it serve as an indication for adjoining counties in Idaho and Oregon.

In Jackson County (table 2) approximately 50 percent of the fields surveyed were inhabited by threatening weevil populations. The parasite, first introduced into this area in 1934, was recovered from every field examined in the fall of 1937. Its increasing abundance indicates that it may develop into an important factor in alfalfa weevil control for this area.

Table 2.--Survey results, Jackson County, Oreg.,
sampled October 5-28, 1937

Field No.	H. postica adults Number	B. curculionis cocoons	
		Present Number	Viable Number
1 - - - - -	2.50	4.25	.50
2 - - - - -	3.50	2.00	.75
3 - - - - -	1.00	9.75	3.25
4 - - - - -	1.50	6.00	.75
5 - - - - -	1.00	2.50	1.50
6 - - - - -	0	2.50	1.00
7 - - - - -	1.25	6.50	3.75
8 - - - - -	.25	4.50	2.75
9 - - - - -	.75	3.00	1.75
10 - - - - -	1.25	.25	.25
11 - - - - -	.25	2.25	.50
12 - - - - -	1.50	6.50	2.50
13 - - - - -	.25	6.00	1.50
14 - - - - -	2.50	4.25	2.00
15 - - - - -	2.50	3.75	1.50
16 - - - - -	2.00	7.25	3.75
17 - - - - -	3.00	5.25	2.50
18 - - - - -	1.75	1.75	0
19 - - - - -	2.25	8.00	2.25
20 - - - - -	4.50	8.25	1.25
21 - - - - -	3.25	3.50	1.00
22 - - - - -	2.25	5.25	.75
23 - - - - -	4.00	2.75	2.00
24 - - - - -	4.25	.50	.25
25 - - - - -	1.75	2.50	1.50
Average -	1.96	4.36	1.58

IDAHO

Alfalfa weevil damage in the lower Snake River Valley of western Idaho was negligible in 1937, affecting only about 2 percent of the fields. The injury was largely concentrated in Ada County. Approximately 10 percent of fields in eastern Idaho (upper Snake River Valley) were injured, but only in Bingham County was the damage severe.

The survey in eastern Idaho again included parts of five counties, viz, Bingham, Bonneville, Jefferson, Madison, and Fremont. The first two counties were treated as a subdistrict, because a somewhat longer growing season occasionally permits harvest of three alfalfa crops. The other three counties are strictly two-crop areas and were treated as a separate subdistrict. In Bonneville and Bingham Counties (table 3) potentially injurious weevil populations existed in approximately one-fourth of the fields examined. Fall abundance of viable parasite cocoons promised highly effective parasitization for 1938.

Table 3.--Survey results, Bingham, and Bonneville Counties, Idaho, sampled September 13-14, 1937

Field No.	:	H. postica adults	:	B. curculionis cocoons	
				Present	Viable
		Number		Number	Number
1 - - - - -	:	1.00	:	4.50	3.25
2 - - - - -	:	.75	:	17.75	4.75
3 - - - - -	:	1.75	:	21.75	3.75
4 - - - - -	:	1.00	:	4.50	.50
5 - - - - -	:	2.50	:	10.25	2.00
6 - - - - -	:	2.50	:	5.25	2.75
7 - - - - -	:	1.00	:	2.00	1.00
8 - - - - -	:	.25	:	3.50	0
9 - - - - -	:	.75	:	1.00	.50
10 - - - - -	:	1.00	:	19.50	4.50
11 - - - - -	:	1.25	:	16.50	2.00
12 - - - - -	:	.75	:	12.00	2.25
13 - - - - -	:	3.00	:	3.75	.50
Average -	:	1.35	:	9.40	2.13

In Jefferson, Madison, and Fremont Counties (table 4) one-third of the fields surveyed were populated by a menacing number of weevils, and considerable damage for 1938 was indicated. Viable parasite cocoons were sufficient to minimize production of new-generation weevils in 1938.

Table 4.--Survey results, Jefferson, Madison, and Fremont Counties, Idaho, sampled September 14-15, 1937

Field No.	H. postica	B. curculionis cocoons	
	adults	Present	Viable
	Number	Number	Number
1	.50	9.00	1.75
2	3.25	30.00	3.50
3	3.25	9.25	1.75
4	1.25	4.50	.50
5	1.25	6.50	.50
6	.75	17.25	5.75
7	1.00	14.75	1.75
8	.75	15.75	.75
9	5.50	5.75	.50
10	1.25	10.75	.75
11	2.75	14.25	1.00
12	1.25	2.25	1.00
Average	1.90	11.67	1.54

The survey of western Idaho was limited in 1937 to Canyon County, it being considered typical of the important alfalfa-growing area of western Idaho and eastern Oregon.

In Canyon County (table 5) only slight weevil damage is expected in 1938. Of 25 fields, 2 were populated by threatening numbers of weevils. No adult weevils were found in about half the fields examined. Parasite cocoons were scarce but were commensurate with the small weevil populations.

Table 5.--Survey results, Canyon County, Idaho, sampled
September 30-October 1, 1937

Field No.	:	H. postica adults	:	B. curculionis cocoons	
				Present	Viable
		Number		Number	Number
1	-	0	:	1.25	.50
2	-	0	:	.25	.25
3	-	0	:	0	--
4	-	0	:	1.25	.50
5	-	0	:	0	--
6	-	.50	:	13.50	1.25
7	-	0	:	2.00	1.00
8	-	1.00	:	1.50	.25
9	-	.25	:	1.50	.25
10	-	0	:	1.00	0
11	-	1.25	:	17.00	1.25
12	-	1.00	:	1.25	.50
13	-	.25	:	5.50	0
14	-	1.25	:	1.50	.25
15	-	0	:	1.75	.25
16	-	0	:	.75	0
17	-	.50	:	.50	0
18	-	0	:	2.00	.25
19	-	1.00	:	1.25	.25
20	-	3.00	:	7.75	1.25
21	-	2.50	:	10.00	.75
22	-	1.00	:	1.75	0
23	-	.50	:	1.25	.25
24	-	0	:	1.25	.25
25	-	0	:	2.00	.25
Average -	:	0.56	:	3.14	0.38

UTAH

Weevil damage in 1937 occurred in 5 percent of the alfalfa fields in Box Elder, Salt Lake, and Sanpete Counties and amounted to less than 1 percent in Sevier County. The most general injury occurred in Millard County, where 50 percent of the first crop was severely damaged. In Box Elder County (table 6) serious damage is indicated for 1938, as threatening weevil populations existed in 40 percent of the fields during the autumn. Abundance of parasites promised usual effectiveness in minimizing production of new-generation weevils from larvae on the first crop in 1938.

Table 6.--Survey results, Box Elder County, Utah, sampled
October 20-21, 1937

Field No.	H. postica	B. curculionis cocoons	
	adults	Present	Viable
	Number	Number	Number
1 - - - - -	.25	1.00	1.00
2 - - - - -	1.00	8.50	0
3 - - - - -	1.00	3.00	1.75
4 - - - - -	2.50	1.75	.75
5 - - - - -	.75	2.25	1.00
6 - - - - -	3.00	8.00	2.25
7 - - - - -	2.50	16.50	3.00
8 - - - - -	2.25	5.25	1.50
9 - - - - -	1.25	16.75	2.25
10 - - - - -	2.50	6.25	4.00
11 - - - - -	0	3.75	1.50
12 - - - - -	1.00	.25	0
13 - - - - -	1.25	7.50	1.75
14 - - - - -	6.50	7.25	3.00
15 - - - - -	.50	14.00	6.00
16 - - - - -	.75	5.25	4.00
17 - - - - -	2.50	4.50	1.00
18 - - - - -	0	0	-
19 - - - - -	1.25	.50	.50
20 - - - - -	.75	3.75	2.25
21 - - - - -	2.25	2.50	.25
22 - - - - -	3.00	8.25	.50
23 - - - - -	.25	4.75	2.50
24 - - - - -	1.50	3.25	1.25
25 - - - - -	3.00	14.75	3.50
Average -	1.66	5.98	1.82

In Salt Lake County (table 7) one-sixth of the fields surveyed were inhabited by potentially injurious numbers of weevils. Viable parasite cocoons were very abundant and indicated highly effective parasitization in 1938.

Table 7.--Survey results, Salt Lake County, Utah, sampled
October 8-13, 1937

Field No.	:	H. postica adults	:	B. curculionis cocoons	
				Present	Viable
		<u>Number</u>		<u>Number</u>	<u>Number</u>
1	- - - - -	.50	:	1.50	1.00
2	- - - - -	1.00	:	19.50	2.91
3	- - - - -	.50	:	6.25	2.50
4	- - - - -	.25	:	13.00	.50
5	- - - - -	.75	:	9.00	2.75
6	- - - - -	4.00	:	13.50	1.75
7	- - - - -	.75	:	16.50	4.75
8	- - - - -	2.25	:	21.00	4.91
9	- - - - -	1.25	:	24.75	2.15
10	- - - - -	.50	:	11.25	1.50
11	- - - - -	1.00	:	38.25	.31
12	- - - - -	.75	:	12.25	5.50
13	- - - - -	1.75	:	11.75	1.00
14	- - - - -	.75	:	22.00	4.32
15	- - - - -	.50	:	32.50	2.17
16	- - - - -	0	:	2.00	.50
17	- - - - -	1.75	:	6.25	.75
18	- - - - -	2.00	:	5.75	1.75
19	- - - - -	1.25	:	9.75	.25
20	- - - - -	6.25	:	12.75	2.25
21	- - - - -	.25	:	5.25	1.75
22	- - - - -	.25	:	0	--
23	- - - - -	1.00	:	39.00	10.74
24	- - - - -	.50	:	5.50	1.25
25	- - - - -	.25	:	10.00	.75
Average -		1.20	:	13.97	2.32

In Sanpete County (table 8) threatening weevil populations existed during the fall in approximately one-third of the surveyed fields. The survey indicated inadequate parasitization for 1938.

Table 8.--Survey results, Sanpete County, Utah, sampled
November 19-23, 1937.

Field No.	:	H. postica adults	:	B. curculionis cocoons	
				Present	Viable
	:	Number	:	Number	Number
1 - - - - -	:	3.00	:	16.75	1.25
2 - - - - -	:	1.75	:	9.00	1.25
3 - - - - -	:	.25	:	8.75	.50
4 - - - - -	:	2.25	:	4.75	.50
5 - - - - -	:	2.00	:	6.50	1.50
6 - - - - -	:	.75	:	3.50	.25
7 - - - - -	:	.50	:	11.67	2.00
8 - - - - -	:	.75	:	1.50	.50
9 - - - - -	:	5.00	:	4.50	1.00
10 - - - - -	:	0	:	7.50	.75
11 - - - - -	:	2.25	:	13.00	.33
12 - - - - -	:	1.50	:	4.75	1.00
13 - - - - -	:	1.25	:	7.25	.50
Average -	:	1.63	:	7.46	0.86

In Sevier County (table 9) fall abundance of weevils in surveyed fields indicated damage to approximately 8 percent of the alfalfa crop for 1938. Living parasites existed in small numbers but were commensurate with the low level of weevil abundance.

Table 9.--Survey results, Sevier County, Utah, sampled November 22-23, 1937

Field No.	H. postica	B. curculionis cocoons	
	adults	Present	Viable
	Number	Number	Number
1 - - - - -	.50	3.00	1.00
2 - - - - -	1.50	9.00	1.50
3 - - - - -	1.75	.25	0
4 - - - - -	2.00	2.25	0
5 - - - - -	1.25	9.50	.50
6 - - - - -	.50	4.75	.75
7 - - - - -	1.00	2.25	.75
8 - - - - -	.50	7.50	.50
9 - - - - -	.25	1.25	.50
10 - - - - -	0	9.00	.50
11 - - - - -	0	2.25	.75
12 - - - - -	0	0	--
Average-	0.77	4.28	0.55

COLORADO

Of the first alfalfa crop in Mesa, Delta, and Montrose Counties, 5, 25, and 5 percent, respectively, experienced slight economic damage from the alfalfa weevil in 1937. Damage was expected in 75 percent of the Mesa County fields but failed to materialize because of drastic winter kill of adult weevils present in the fall of 1936. In Delta County (table 10) approximately one-fourth of the surveyed fields were occupied by threatening weevil populations. Parasites promised to be effective in curtailing production of weevil adults from first-crop larvae.

Table 10.--Survey results, Delta County, Colo., sampled
November 22-30, 1937

Field No.	H. postica		B. curculionis cocoons	
	adults		Present	Viable
	Number		Number	Number
1 - - - - -	2.50	:	5.75	: 2.00
2 - - - - -	.50	:	.75	: .75
3 - - - - -	1.25	:	.75	: 0
4 - - - - -	.75	:	7.75	: 5.75
5 - - - - -	2.50	:	.75	: .25
6 - - - - -	1.25	:	0	: --
7 - - - - -	.75	:	1.75	: 1.00
8 - - - - -	1.50	:	6.75	: 1.25
9 - - - - -	.75	:	.50	: .25
10 - - - - -	1.50	:	10.75	: 1.25
11 - - - - -	3.00	:	1.25	: 1.00
12 - - - - -	.25	:	0	: --
13 - - - - -	.25	:	.50	: 0
14 - - - - -	.25	:	3.75	: .25
15 - - - - -	.50	:	14.25	: .75
16 - - - - -	.50	:	3.25	: .75
17 - - - - -	0	:	.25	: .25
18 - - - - -	3.00	:	11.75	: 3.00
19 - - - - -	1.75	:	9.25	: 3.25
20 - - - - -	2.50	:	9.50	: 4.25
21 - - - - -	.50	:	2.00	: .50
:				
Average-----:	1.46	:	4.35	: 1.26

In Montrose County (table 11) approximately 10 percent of the fields surveyed were populated by potentially injurious numbers of weevils. Viable parasite cocoons occurred in small numbers but were in keeping with the weevil abundance.

Table 11.--Survey results, Montrose County, Colo., sampled
November 22, 1937

Field No.	H. postica	B. curculionis cocoons	
	adults	Present	Viable
	Number	Number	Number
1 - - - - -	.25	.50	.25
2 - - - - -	.25	3.00	0
3 - - - - -	1.25	6.00	2.50
4 - - - - -	2.25	6.25	1.00
5 - - - - -	.25	3.50	.50
6 - - - - -	0	2.75	.25
7 - - - - -	1.00	2.75	0
8 - - - - -	1.25	2.50	1.50
9 - - - - -	0	0	--
Average- - - -	0.72	3.03	0.67

In Mesa County (table 12) the survey indicated rather general weevil damage for 1938, as 24 percent of surveyed fields were inhabited by a menacing number of weevils. Injury to fields populated by smaller numbers of weevils may also develop because of generally poor growth of the first alfalfa crop in this area, and damage may affect as much as 40 percent of the crop. Fall abundance of viable parasite cocoons promised effective parasitization for 1938.

Table 12.--Survey results, Mesa County, Colo., sampled
October 4-November 12, 1937

Field No.	H. postica adults	B. curculionis cocoons	
		Present	Viable
	Number	Number	Number
1 - - - - -	.75	6.50	1.75
2 - - - - -	2.25	8.75	3.50
3 - - - - -	.25	3.50	1.25
4 - - - - -	4.00	3.75	.25
5 - - - - -	1.50	6.00	1.25
6 - - - - -	2.25	4.00	1.00
7 - - - - -	1.50	2.50	.25
8 - - - - -	.25	15.75	1.75
9 - - - - -	1.25	6.50	.25
10 - - - - -	2.50	13.25	2.00
11 - - - - -	.25	8.50	.50
12 - - - - -	.25	4.00	0
13 - - - - -	.75	1.75	.75
14 - - - - -	.50	7.75	.25
15 - - - - -	1.25	14.75	1.00
16 - - - - -	0	3.00	.25
17 - - - - -	1.00	10.25	3.50
18 - - - - -	.50	1.25	.25
19 - - - - -	1.50	2.00	1.00
20 - - - - -	1.00	0	--
21 - - - - -	0	2.75	1.50
22 - - - - -	2.50	6.25	1.25
23 - - - - -	2.00	15.00	1.75
24 - - - - -	.50	.75	0
25 - - - - -	0	5.25	2.00
Average - - - -	1.14	6.15	1.09

NEVADA

Losses from the alfalfa weevil in western Nevada during 1937 were slight except in Douglas County, where 50 percent of the fields were severely damaged because very large acreages prevented timely cutting. Washoe County experienced from slight economic damage to 10 percent of the first crop. In Churchill County less than 1 percent was injured.

In Douglas County (table 13) one-sixth of the surveyed fields were inhabited by threatening numbers of weevils, as was the case in the 1936 survey. Because of the widespread damage in 1937, developments, especially on large alfalfa acreages, should be watched closely with a view to possible insecticidal treatment, as this is the most satisfactory means of control for this area. Living parasites were abundant and ordinarily would be highly effective were it not for the late cutting practiced in this district.

Table 13.--Survey results, Douglas County, Nev., sampled
November 5-6, 1937

Field No.	H. postica adults	B. curculionis cocoons	
		Present	Viable
	Number	Number	Number
1 - - - - -	0	6.00	1.75
2 - - - - -	.50	1.25	.50
3 - - - - -	.25	13.25	1.50
4 - - - - -	1.25	21.25	2.30
5 - - - - -	3.00	29.00	5.43
6 - - - - -	4.75	39.50	2.34
7 - - - - -	1.50	7.50	2.00
8 - - - - -	1.25	9.75	1.75
9 - - - - -	.25	19.00	1.75
10 - - - - -	1.00	10.25	.75
11 - - - - -	1.00	8.50	0
12 - - - - -	1.25	22.25	1.43
Average- - -	1.33	15.63	1.79

In Washoe County (table 14) menacing weevil populations existed in one-third of the fields surveyed. Parasite cocoons were abundant but their viability was very low and indicated ineffective parasitization for 1938.

Table 14.--Survey results, Washoe County, Nevada, sampled
November 7-8, 1937

Field No.	:	H. postica adults	:	B. curculionis cocoons	
				Present	Viable
	:	Number	:	Number	Number
1 - - - - -	:	2.25	:	19.50	1.33
2 - - - - -	:	3.25	:	3.25	1.50
3 - - - - -	:	1.25	:	4.25	.75
4 - - - - -	:	1.00	:	8.75	.50
5 - - - - -	:	.50	:	8.25	.25
6 - - - - -	:	2.00	:	17.25	1.25
7 - - - - -	:	1.25	:	3.25	0
8 - - - - -	:	.75	:	2.50	0
9 - - - - -	:	.75	:	.75	0
10 - - - - -	:	.25	:	13.50	1.25
11 - - - - -	:	1.00	:	8.25	2.00
12 - - - - -	:	9.50	:	68.75	.50
Average - - - -	:	1.98	:	13.19	0.77

In Churchill County (table 15) the level of alfalfa weevil abundance was very low. Only 2 of 25 fields were inhabited by menacing numbers of weevils and in 10 fields no weevils were found. The number of living parasites was also low but they were sufficiently numerous to be effective, except where large acreages make cutting very late.

Table 15.--Survey results, Churchill County, Nev., sampled
November 3-5, 1937

Field No.	H. postica	B. curculionis cocoons	
	adults	Present	Viable
	Number	Number	Number
1 - - - - -	0	1.75	.50
2 - - - - -	0	6.00	0
3 - - - - -	.25	10.00	1.00
4 - - - - -	1.00	15.25	1.75
5 - - - - -	.50	15.50	.25
6 - - - - -	.25	.25	0
7 - - - - -	.25	2.25	.50
8 - - - - -	.25	10.00	.50
9 - - - - -	0	1.00	0
10 - - - - -	1.00	37.00	2.14
11 - - - - -	.25	1.50	.50
12 - - - - -	2.00	25.25	.89
13 - - - - -	.75	6.25	.75
14 - - - - -	.25	15.75	0
15 - - - - -	2.25	13.00	.25
16 - - - - -	0	16.25	.20
17 - - - - -	.50	4.75	0
18 - - - - -	0	1.00	.25
19 - - - - -	0	2.25	.25
20 - - - - -	0	.25	0
21 - - - - -	0	4.25	.50
22 - - - - -	0	.50	0
23 - - - - -	0	23.25	0
24 - - - - -	.50	4.75	0
25 - - - - -	.25	10.50	1.50
Average - - -	0.41	9.14	0.46

NEBRASKA

The consistently cold winter of 1936-37, with little protective snow covering, followed by a cold, damp spring, prevented development of weevil injury in Sioux County in 1937. In Sioux County (table 16)

only 1 of 12 fields surveyed was populated by a potentially injurious number of weevils. Parasite cocoons were scarce but the high percentage of them alive indicated effective parasitization for 1938.

Table 16.--Survey results, Sioux County, Nebr., sampled
October 10-12, 1937

Field No.	:	H. postica	:	B. curculionis cocoons	
				Present	Viable
		Number		Number	Number
1 - - - - -	:	0	:	13.25	5.00
2 - - - - -	:	0	:	0	--
3 - - - - -	:	2.75	:	4.75	2.25
4 - - - - -	:	0	:	.50	0
5 - - - - -	:	.25	:	0	--
6 - - - - -	:	0	:	.25	0
7 - - - - -	:	0	:	0	--
8 - - - - -	:	0	:	.50	.50
9 - - - - -	:	.25	:	.25	0
10 - - - - -	:	0	:	1.50	.50
11 - - - - -	:	.25	:	1.25	.50
12 - - - - -	:	0	:	.25	0
Average - - - - -	:	0.29	:	1.88	0.73

OUTLOOK FOR WEEVIL DAMAGE IN 1938

The fall survey of 1937 showed that alfalfa weevil populations had increased generally in the infested territory since the fall of 1936. Most severe damage for 1938 is indicated for Box Elder County, Utah, and Jackson County, Oreg., where from 40 to 50 percent of the surveyed fields had damaging numbers of weevils. From 17 to 33 percent of the fields are menaced in Salt Lake and Sanpete Counties, Utah, the several counties constituting the upper Snake River Valley of eastern Idaho, Eagle Valley in Baker County, Oreg., Douglas and Washoe Counties, Nev., and Delta and Mesa Counties, Colo. Damage to approximately 10 percent of alfalfa fields is indicated for Sevier County, Utah, the lower Snake River Valley of western Idaho and eastern Oregon, Churchill County, Nev., Montrose County, Colo., and Sioux County, Nebr.

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THE MORE IMPORTANT RECORDS FOR MARCH

Throughout the upper Great Plains region grasshopper eggs are still in good condition and but very little winter mortality has been reported. In the more southern States of Oklahoma, Texas, Utah, and Arizona, and in southern California as high as 10 percent of the eggs have already hatched.

Mormon crickets started hatching in mid-January in Nevada. By the end of February they were hatching in parts of Montana, and in March we received reports of hatching from Wyoming, Utah, and Washington.

May beetles were observed at lights in Mississippi and Louisiana during the latter half of March. It is estimated that 400,000 acres of wheat have been destroyed by white grubs in south-central Kansas. Heavy damage is also reported in parts of Oklahoma.

The army cutworm is becoming numerous in parts of Kansas and Oklahoma.

Heavy flights of armyworm moths were observed late in March in Virginia, Indiana, Missouri, and Oklahoma.

Observations late in March indicate that the chinch bug has passed the winter very successfully in Illinois, Iowa, and Oklahoma. In the latter State rather heavy flights were observed on March 25 during a period of high temperature.

A local outbreak of green bug was observed near Stillwater, Okla., and in the southwestern part of the State. This insect was reported as doing considerable damage in northwestern Texas.

Light infestations of hessian fly are recorded from Missouri and Kansas.

Corn ear worm eggs were found in central Texas during the third week in March. This insect is also recorded as having passed the winter successfully on Long Island, N. Y., and in Utah.

The pea aphid was reported as present in alfalfa during the last week in March in Virginia, Louisiana, Oklahoma, Texas, and Washington.

Overwintering larvae of codling moth were beginning to pupate in Georgia and Delaware during the third week in March. This insect seems to have passed the winter successfully over most of the country.

The first pupa of oriental fruit moth was observed in Georgia on March 19. In Delaware, 28 percent of the larvae had transformed by March 23.

Plum curculio adults began to appear in the Fort Valley section of Georgia on March 4 and in marauding numbers by the middle of the month. They were beginning to appear in numbers by March 23 in Albemarle County, Va.

Green citrus aphid was numerous in central Florida during the first week in March. By the middle of the month, however, the infestation had subsided, apparently owing to large populations of the Chinese ladybeetle (Leis dimidiatus F.).

The vegetable weevil was abundant enough in tobacco plant beds in Georgia and Florida to necessitate control measures. Rather severe damage to turnips is reported from Mississippi and Louisiana. The weevil was also reported damaging cover crops in southern California.

During the third week in March a very heavy infestation by harlequin bug was observed on cabbage and mustard in the Chadbourn district of North Carolina. The first individuals of these insects were observed in the Norfolk district of Virginia during the fourth week in the month. This insect is also reported as quite numerous throughout southeastern Oklahoma.

Rather heavy infestations of tobacco flea beetles were reported from Tennessee during the third week in March. The insect was reported from South Carolina and Virginia, but little damage has been done.

Very large numbers of male cankerworm moths have been observed in Illinois, Iowa, Missouri, and Nebraska. Heavy stripping of foliage of apple trees is reported from Oklahoma and this insect is also recorded as emerging in Ohio, Pennsylvania, and New Jersey.

The outbreak of Epinotia meritana Heinr., first recorded last year in the Powell National Forest, Utah, appears to be as heavy, if not heavier, than it was last year.

A very heavy infestation of sandflies in the vicinity of Savannah, Ga., was reported this year. It is said to be the most serious outbreak in the last 5 years.

During the third week in March several specimens of dog ticks were collected from different localities on Marthas Vineyard Island in Massachusetts.

Cattle grubs are reported as being more abundant than during the last 3 years in Iowa. Dropping of the grubs is somewhat earlier than usual in Georgia and Missouri.

Buffalo gnats are causing some trouble in parts of Mississippi, although the situation is not as serious as in 1933.

G E N E R A L F E E D E R S

GRASSHOPPERS (Acrididae)

Iowa. H. E. Jaques (March 21): Grasshopper eggs seem to be unusually abundant throughout much of the State, particularly in the southern and western parts.

North Dakota. F. Gray Butcher (March 23): Observations indicate that eggs have overwintered with no noticeable injury. Many reports of overwintering nymphs from various sections.

Missouri. L. Haseman (March 24): Recent egg check-ups indicate relatively little winter mortality. We are expecting a very heavy hatch.

Arkansas. R. L. Shotwell (March 28): Melanoplus differentialis Thos. is the dominant species of grasshopper in the northeastern part of Arkansas. The eggs are in good condition and hatching is expected to begin about April 20.

Kansas. H. R. Bryson (March 29): Grasshopper eggs are abundant in practically every section of the State. Observations indicate that they have overwintered in perfect condition. Eggs dug out of the soil at Manhattan on March 21 and kept in the laboratory hatched in a few days. Third-and fourth-instar nymphs of Chortophaga spp. were plentiful in Riley County about the middle of the month.

Oklahoma. H. T. Rainwater (March 23): Farmers attending organization meetings for grasshopper control at Ardmore, in Carter County, and other places reported occurrence of newly hatched grasshoppers on March 23. This was confirmed in some places by survey observations.

C. F. Stiles (March 25): Recent examinations of eggs in scattered communities throughout the northeastern and central parts of the State show that they are in good condition. A few eggs brought into the office and kept at warm temperatures have already hatched. A small number of hoppers of the noninjurious species have also been reported.

B. A. Bieberdorf (March 26): Grasshopper eggs were reported as hatching in a few isolated places during the week of March 13-19.

Texas. R. R. Reppert (March 26): In a few limited and favorably exposed areas in Navarro County, northeastern Texas, 100 newly hatched nymphs per square foot were found. (March 28): A survey of Montgomery and Walker Counties, in southeastern Texas, today indicated hatching practically completed, with from 5 to 10 nymphs per square foot.

Montana. H. B. Mills (March 21): Numerous reports of overwintering nymphs of C. viridifasciata Deg. from eastern Montana.

Utah. G. F. Knowlton (March): Reports of grasshoppers hatching in northern and central Utah were made on March 10, 14, 19, and 22. Grasshopper nymphs (probably Haldeman's locust (Pardalophora haldemanii Scudd.)) were moderately abundant in rye stubble west of Eureka, in the central part of the State, on March 11.

Arizona. J. R. Parker (March 29): Not more than 10 percent of the grasshopper eggs in Maricopa and Yuma Counties are hatched. Baiting in these counties before April 20 appears to be unnecessary.

California. J. R. Parker (March 29): Not more than 10 percent of the eggs in the Imperial Valley are hatched. No hatching north of this valley.

MORMON CRICKET (Anabrus simplex Hald.)

Montana. H. B. Mills (February 26): Mormon crickets began hatching in the lower Yellowstone Valley on February 26.

Wyoming. Margaret Greenwall (March 24): C. L. Corkins reported that Mormon crickets were hatching generally in southern exposures over most of Sheridan County, on the northern border near the central part of the State, during the entire week beginning March 7.

Utah. C. J. Sorenson (March): These crickets were found hatching in the western part of the State in Tooele County on March 11 and in Millard County on March 15.

Nevada. G. G. Schweis (March 22): The Forest Service has reported having observed a hatching of Mormon cricket eggs the middle of January.

Washington. R. Nelson (March 20): The first of the Mormon cricket in Franklin County has appeared 4 miles north of Pasco.

MAY BEETLES (Phyllophaga spp.)

Mississippi. C. Lyle (March 24): F. A. Smith reports that May beetles were abundant at lights on the streets of McComb the night of March 15. A correspondent at Picayune, in Pearl River County, reports under date of March 21 that May beetles were so numerous in that vicinity as to defoliate rose bushes and oak and pecan trees.

E. W. Dunnam (March): One beetle was taken on a window screen near a light in Leland on March 21 and two were taken at the same place on March 22.

Louisiana. B. A. Osterberger (March 19): The first flight of June bugs was noted on March 19. The most numerous species was P. congrua Lec. The night was very warm and sultry, the temperature being 73° and the humidity 92.

Kansas. H. R. Bryson (March 29): White grubs have been numerous in gardens. The adults are just beneath the surface of the soil, ready to fly when the soil temperature rises.

CUTWORMS (Noctuidae)

Virginia. A. M. Woodside (March 23): Climbing cutworms were fairly common on peach trees in low spots at Crozet, Albemarle County.

H. G. Walker and L. D. Anderson (March 25): Cutworm eggs were observed on a spinach leaf at Norfolk on March 10.

Kansas. H. R. Bryson (March 29): The army cutworm (Chorizagrotis auxiliaris Grote) has about returned to normal numbers after a scarcity of a few years. They are most numerous in grass plots, but may be found in alfalfa fields. Slight injury to seedling beets and spinach was observed at Manhattan on March 27.

J. R. Horton (March 25): Worms of C. auxiliaris, half grown or more, were in evidence on winter wheat near Wichita, southeast of the central part of the State, but were not numerous.

H. H. Walkden (March 25): Larvae of the army cutworm are abundant in pastures in Riley, Clay, and Cloud Counties, northeast of the central part of the State. This is in marked contrast with 1937, when the larvae of this species were very scarce. Larvae of the dingy cutworm (Feltia subgothica Haw.) are abundant in pastures near Manhattan, Riley County. Small larvae of the clay-backed cutworm (F. gladiaria Morr.) are common in areas where little barley is the dominant grass.

Oklahoma. F. A. Fenton (March 28): The army cutworm has been found in wheat in several widely distributed places in the State, particularly in Tillman and Kiowa Counties.

Arizona. C. D. Lebert (March 25): On March 23 some damage by cutworms was noticed on melons south of Phoenix area. Adults of F. annexa Treit. were taken in a citrus field on February 4.

BUTTERFLIES AND MOTHS (Lepidoptera)

Pennsylvania. H. E. Hodgkiss (March 24): At State College on March 22 a specimen of the mourning-cloak butterfly (Hamadryas antiopa (L.)) was taken and on March 19 one specimen of the scallop shell moth (Calocalpe undulata L.) was collected.

Virginia. H. G. Walker and L. D. Anderson (March 25): A luna moth (Tropaea luna L.) was collected on March 23 near Norfolk.

Tennessee. G. M. Bentley (March): The tiger swallowtail (Papilio glaucus turnus L.) is emerging. One adult was brought to this office on the 19th and one on the 21st.

Georgia. T. L. Bissell (March 10): Butterflies of the alfalfa caterpillar (Eurymus eurytheme Bdv.) are on the wing at Experiment.

Florida. J. R. Watson (March 23): Woolly bears are out in force in some sections, feeding mostly on Rumex acetosella and other plants and occasionally doing much damage to melons and young corn.

Missouri. L. Haseman (March 24): Along with male cankerworm moths and an occasional armyworm and cutworm moth at Columbia, a number of different species of moths came to lighted windows and street lights during the last few nights. They appear to be noctuids, but there are also a number of other undetermined species included.

Colorado. C. R. Jones (March 26): Mourning-cloak butterflies are emerging regularly. Specimens of the adults of Autographa californica (Speyer) have been taken.

CRANE FLIES (Tipulidae)

Georgia. T. L. Bissell (March 10): "Perrywinkles," or larvae of a species of crane fly, are abundant in streams at Experiment. They are used for fish bait.

Mississippi. E. W. Dunnam (March 25): Many large crane flies are present in the vicinity of Leland. A few have been observed since March 10.

COMMON RED SPIDER (Tetranychus telarius L.)

Mississippi. C. Lyle (March 24): H. Gladney reports under date of March 22 that he has observed considerable injury to azaleas, camellias, and arborvitae in Jackson County. Cape-jasmine leaves showing injury by these mites were received from Issaquena County on March 23, and a correspondent at Biloxi, in Harrison County, sent camellia leaves damaged by them to this office on March 21.

E. W. Dunnam (March 24): The red spider was found damaging cotton plants in a greenhouse at Stoneville.

Louisiana. B. A. Osterberger (March 19): These spiders have been very numerous on flowering sweet peas and have caused a yellowing of the leaves.

Missouri and Kansas. H. Baker (March 23): There has been but little mortality of hibernating red spiders on apple trees, therefore greater numbers of healthy specimens can be found on apple trees in northeastern Kansas and northwestern Missouri than ever before at this season of the year under this writer's observation.

CEREAL AND FORAGE-CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

ARMYWORM (Cirphis unipuncta Haw.)

Virginia. H. G. Walker and L. D. Anderson (March 25): Rather large numbers of armyworm moths were observed flying around lights on the evenings of March 23 and 24 in Princess Anne County.

Indiana. P. Luginbill (March 23): For several days armyworm moths have been noticed flying about La Fayette and vicinity. They were first noticed on March 20 and 21. Hundreds of them were observed feeding on pussy willow on the University grounds. For the last several days we have had strong southerly winds and possibly they have been blown up from the south. The temperature has also been favorable for flights. On March 22 it was 77° F.

Missouri. L. Haseman (March 24): The early season flight of moths has begun around Columbus, although they haven't been abundant. The moths do not seem to be worn by long flight, therefore it is possible that they are emerging here.

Oklahoma. F. A. Fenton (March 28): C. unipuncta has been found in wheat in several widely distributed places, in Tillman and Kiowa Counties, particularly.

CHINCH BUG (Blissus leucopterus Say)

Illinois. W. P. Flint (March 22): Examinations made during the last month continue to show a very high percentage of survival for the winter.

Iowa. C. J. Drake (March 25): The chinch bug survey now in progress shows that the winter mortality during 1937-38 has been considerably lower than during the last 4 or 5 years. Threatening populations of overwintering bugs occur in most of the counties in the southern third of the State. The infestation is apparently more spotted in the eastern half of the State.

H. E. Jaques (March 21): In the southeastern part of the State chinch bugs are fairly abundant.

Oklahoma. R. G. Dahms (March 26): There was a rather heavy flight of chinch bugs from winter quarters to small grains on March 25, when the temperature reached 82° F. Only a very few bugs had migrated prior to that date, although the temperature reached 85° on March 20 and 21. (Reported from the State Field Station at Lawton, Comanche County, southwestern Okla.)

GREEN BUG (Toxoptera graminum Rond.)

Oklahoma. C. F. Stiles (March 25): A local outbreak of this pest was observed 10 miles southeast of Stillwater, in Payne County. The spots range in area from a few square feet to 20. Some winged forms were observed. Ladybeetle larvae are very numerous and under favorable conditions should check the outbreak.

R. G. Dahms (March 26): The green bug has done considerable damage in a few wheatfields in the southwestern part of the State.

Texas. F. L. Thomas (March 21): Green bugs were reported as doing considerable damage to wheat in Hale, Floyd, and Fisher Counties in northwestern Texas, on March 18.

HESSIAN FLY (Phytophaga destructor Say)

Missouri. E. T. Jones (March): Survey of select fields in five southwestern counties revealed infestation in 33 percent of the fields examined. Infestations ranged from 8 to 18 percent, with low intensity. Greatest infestation was found in Greene County, where 86 percent of overwintering larvae had pupated on March 16.

Kansas. J. R. Horton (March 10): An unusually mild winter started development of the hessian fly during the first half of February, as indicated by a little pupation and emergence. Examinations up to February 18, when interrupted by snow and colder weather, showed about 1.5 percent living pupae and about 1.5 percent emergence. On February 18-19 snow fell, covering the ground to a depth of 9 inches and finally disappearing on February 27. No damage was done to the fly, unless to the negligible percentage that had passed beyond the larval stage.

E. T. Jones (March): Survey of the infestation of select fields in 10 southeastern Kansas counties was made on March 12-16. Light infestations, ranging from 2 to 20 percent, with low puparia intensity, were found in 50 percent of the fields. Highest infestations were

found in Geary County where, on March 18, larvae were found to have wintered in good condition. On March 18, 66 percent had pupated, about 2 weeks earlier than usual. Although it is possible for a second spring brood to build up a strong infestation, only light, spotted infestations are indicated at this time.

WHEAT WHITE GRUB (Phyllophaga lanceolata Say)

Kansas. H. R. Bryson (March 29): P. lanceolata has been destructive in a number of counties in the State. The population apparently has been building up during the last few years. The area of damage has gradually extended northward. The northernmost limit of injury occurred at Glasco, Cloud County, on March 25. E. G. Kelly estimates that approximately 400,000 acres of wheat has been devastated. Most of this injury has been on land that has been cropped continuously to wheat for 4 or 5 years. The area most affected lies in the south-central part of the State, the maximum amount of injury being in Harper County.

Oklahoma. R. G. Dahms (March 26): This pest is very abundant in some wheatfields. In a heavily infested field in Comanche County, in southwestern Oklahoma, an average of 25 grubs per square yard were found. The weather has been so favorable for wheat growth that very little wheat has been killed by the grubs in the last 2 or 3 weeks.

G. A. Bieberdorf (March 26): In the wheat-growing sections the wheat white grub has been doing considerable damage during the past winter. The heaviest damage appears to be in Grant, Alfalfa, and Kay Counties, on the northern border in the central part of the State.

F. A. Fenton (March 28): The recent favorable weather for wheat growth has stopped the damage by P. lanceolata, inasmuch as the wheat plants have now developed root systems large enough to withstand considerable injury.

Arizona. E. E. Russell (March 28): Since March 17, with mean temperature at 57.2° F., Say's stinkbug (Chlorochroa sayi Stal) has occurred in greater numbers than common on mature wild mustard (Sisymbrium irio) which has been permitted to grow as a cover crop among young citrus in the Citrus Belt east of Mesa. When first observed these bugs were uniformly dark olive green in color, indicating that they had recently emerged from winter quarters. Egg development in the ovaries of the females when first observed was scant, but at present are nearly fully developed. Little, if any, oviposition has occurred in the field. Considerable gregariousness has been observed, particularly on the sunny side of clumps of heavy mustard with south and east exposure, where from 15 to 30 bugs have frequently been collected by striking the opposite side of the mustard clump over a standard sweeping bag. An average of 0.146 bug per sweep has been taken by

ordinary sweeping methods. A total of 959 adults have been examined showing 55 percent of the total number collected were females. The tachinid parasite Gymnosoma fuliginosa Desv. is present in reasonably small numbers.

MITES (Acarina)

Texas. F. L. Thomas (March 21): An unknown mite, larger than the red spider, caused local damage to oats in Hood, Bosque, and Denton Counties the latter part of January and in February. Investigations showed that the infestation occurred only on land where oats had been planted continuously for several years.

CORN

CORN EAR WORM (Heliothis obsoleta F.)

New York. L. A. Carruth (March 22): Conditions on Long Island seem favorable for the survival of the corn ear worm pupae. The natural mortality of the pupae during the winter months is probably between 95 and 99 percent, but the survival of even a few individuals is sufficient to insure serious infestations during the following season. During the spring of 1937 live pupae were found on Long Island and reared to adults. From present indications, this situation will apparently be repeated during the spring of 1938.

Texas. F. L. Thomas (March 21): Eggs have been found in alfalfa in Falls County, central Texas, although no emergence of adults has yet occurred in Brazos County. Very strong evidence has been obtained this year indicating that the moths spread rapidly over considerable distances.

Utah. H. E. Dorst (March 14): A recovery of approximately 65 percent of the pupae has been obtained this spring from overwintering cages that successfully transferred from larvae last fall. A recovery of approximately 50 percent of the pupae were obtained in unplowed corn-fields.

SOUTHWESTERN CORN BORER (Diatraea grandiosella Dyar)

Texas. F. L. Thomas (March 21): This insect was found to have extended its range east to Wilbarger County and southeast to Taylor County, according to the survey last fall. It has been distributed throughout the Panhandle for several years.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

Utah. G. F. Knowlton (March 14): An adult weevil was observed to be active in an alfalfa field at Riverside, in northern Utah.

California. A. E. Michelbacher (March 22): The average number of alfalfa weevil larvae collected per 100 sweeps of an insect net for different fields in the San Joaquin Valley on March 14 ranged from 6 to 442, in the San Francisco Bay area on March 21 ranged from 2 to 198, while on the same date the range at Pleaston was from 1 to 27. Parasitization of large alfalfa weevil larvae by Bathyploctes curculionis Thos. in the different fields in the San Joaquin Valley on February 24 ranged from less than 1 percent to 2 percent, but since that time has increased considerably. Parasitization in the San Francisco Bay area on March 8 was 88 percent.

PEA APHID (Illinoia pisi Kltb.)

Virginia. H. G. Walker and L. D. Anderson (March 25): Pea aphids are becoming rather abundant in alfalfa fields at Norfolk and a few winged forms have been collected in pea fields.

Louisiana. C. O. Eddy (March): These aphids have been common throughout the State during the month of March.

Oklahoma. R. G. Dahms (March 26): The pea aphid is abundant in many fields of alfalfa in southwestern Oklahoma.

Texas. F. L. Thomas (March 21): Plant lice are reported to be causing severe damage to alfalfa in Collingsworth County, in northwestern Texas.

Washington. R. D. Eichmann (March 4): Green alfalfa at Walla Walla, barely over 1 inch tall, yields as many as four aphids per sweep of an insect net. More than a third of these are immature forms, several of which have wing pads. Many aphids were found on bottom-land alfalfa last fall. Aphids gave birth to young at Pullman all winter.

PLANT BUGS (Hemiptera)

Utah. G. F. Knowlton (March 14): In northern Utah in alfalfa fields and on roadside weeds Lygus elisus hesperus Knight is active and adults of Agallia sanguinolenta Prov. are abundant.

THREE-CORNERED ALFALFA HOPPER (Stictoccephala festina Say)

Louisiana. L. O. Ellisor (March): Nymphs are beginning to hatch at Baton Rouge.

CLOVER

CLOVER LEAF WEEVIL (Hypera punctata F.)

Illinois. W. P. Flint (March 22): This weevil is appearing in much more than normal numbers in the clover fields in the central part of the

State. Apparently the mild winters of 1936-37 and 1937-38 are responsible for the very high survival. It is already ragging clover and alfalfa in many fields.

California. A. E. Michelbacher (March 22): Most of the larvae collected on March 8 in the San Joaquin Valley were dead. It appeared that a fungus disease was causing this mortality.

SUGARCANE

SUGARCANE BORER (*Diatraea saccharalis* F.)

Louisiana. B. A. Osterberger (March 17): A few borers have been found in the pupal state. No eggs have been found.

E. K. Bynum, W. E. Haley, and L. J. Charpentier (March): The examination of cane trash on top of the soil in overwintering experiments in the southern part of the sugar section revealed that 13 percent of the larvae had pupated by March 2 and by March 15 the percentage had increased to 50. The first pupa was found on February 9. On March 21, 4 egg clusters, with an average of 26 fertile eggs per cluster, were found at Houma in 1 man-hour.

SUGARCANE BEETLE (*Euetheola rugiceps* Lec.)

Louisiana. B. A. Osterberger (March 17): This beetle was noticed doing considerable injury to stubble cane around the Bayou Teche section, St. Mary Parish. Skunks have done much in the control by digging out the adults for food. Adults are being collected at lights.

J. W. Ingram (March 10): Injury to sugarcane appeared in the vicinity of Franklin early in March. On 1 plantation 1,230 beetles were collected at 3 500-watt trap lights on March 10. Warmer temperatures than usual for late February and early March have caused the beetles to become active earlier than usual.

F R U I T I N S E C T S

SAN JOSE SCALE (*Aspidiotus perniciosus* Comst.)

Georgia. T. L. Bissell (March 23): A correspondent at Hawkinsville reports that he finds almost no San Jose scale.

Mississippi. C. Lyle (March 24): Jack Milton, at Jackson, and N. L. Douglass, at Grenada, report that the San Jose scale is causing severe damage to unsprayed fruit trees in their districts.

Colorado. C. R. Jones (March 26): Numerous requests have come to this office for control of this pest.

TARNISHED PLANT BUG (Lygus pratensis L.)

Missouri. L. Haseman (March 24): This bug is on wing, visiting fruit buds and blossoms literally by the millions throughout central Missouri.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (March 26): Notwithstanding the lower temperatures this year in Poughkeepsie, Dutchess County (-22° F., as compared to 40° in previous years), larval mortality under bands appears to be low. Snow covered the ground over longer periods than in the winter of 1936-37, which may have caused more larvae to be destroyed by birds. While the percentage of infested fruit was somewhat lower in this region in 1937 than it was in 1936, it should be remembered that the crop was unusually large. At this time it is estimated that the overwintering larvae per tree in most orchards is about the same as it was last spring.

Delaware. L. A. Stearns (March 23): The season is unusually early and the apples are well advanced. Early varieties are in full delayed dormant stage. Pupation of overwintered larvae is 1 percent. In 1937 transformation did not begin until between April 16 and 26.

Georgia. C. H. Alden (March 24): Overwintering larvae are beginning to pupate at Cornelia. About 25 percent of the larvae are dead and appear to have been killed by a fungus.

Wisconsin. C. L. Fluke (March 31): The mortality of overwintering larvae was low and practically none was found dead in orchards in Crawford County. More larvae went into winter quarters than have been observed for several years, indicating a large first brood of moths in western Wisconsin.

Missouri and Kansas. H. Baker (March 23): Recent observations in orchards in northeastern Kansas and northwestern Missouri indicate that larvae came through the mild, open winter with a minimum of mortality and that they are unusually abundant. Several growers have noted the fact that birds were relatively scarce in orchards during the winter.

Kansas. H. R. Bryson (March 29): Larvae of the codling moth were reported by R. L. Parker to be abundant during the winter in Doniphan County. Mortality is low.

EASTERN TENT CATERPILLAR (Malacosoma americana F.)

- New York. J. A. Evans (March): Egg masses of the apple tree tent caterpillar brought into a warm room on March 29 started hatching that day.
- Pennsylvania. H. E. Hodgkiss (March 24): Eggs were not as abundant as they have been the last 3 years, as observed in a survey on March 14 to 16.
- Virginia. M. P. Jones (March 31): The eastern tent caterpillar is feeding on wild cherry near Fort Myer, Arlington County.
- North Carolina. W. A. Thomas (March 6): The eggs began hatching at Chadbourn the first of March, before any foliage had developed on wild cherry. The tents are much more abundant this season than last.
- Georgia. O. I. Snapp (March 24): The first larvae of the eastern tent caterpillar were observed on February 25 in a peach tree near Fort Valley, central Georgia. These larvae were from $\frac{1}{4}$ inch to $\frac{1}{2}$ inch long on that date. The infestation to March 24 is not greater than that of an average year.
- T. L. Bissell (March 17): Tent caterpillars are just starting their webs in wild cherry at Experiment. (March 23): A correspondent reports an unusually large number of tent caterpillar webs in the fruit trees at Hawkinsville.
- Florida. A. H. Madden (March 14): A considerable number of full-grown larvae were noted on March 11 and 12 at Quincy, Gadsden County. Very little damage was observed, however.
- Mississippi. J. G. Hester (March 24): A number of colonies of this insect on wild cherry in the vicinity of State College has been observed during the last few weeks.
- Arkansas. W. J. Baerg (March 10): Hatching has just begun and a few caterpillars have emerged from about half of the egg masses. The species will be common but not very abundant, as judged by the number of egg masses.

APPLE APHIDS (Aphidae)

- Connecticut. P. Garman (March 23): Eggs of Anuraphis roseus Baker and Aphis pomi Deg. are much more abundant than they were last year, and occur in large numbers in many orchards throughout the State. Few have hatched.
- New York. J. A. Evans (March): Grain aphids (Rhopalosiphum prunifoliae Fitch) were observed for the first time in the college orchard at Ithaca on March 29. Last year they did not make their appearance until April 26.

Pennsylvania. H. E. Hodgkiss (March 24): Aphid eggs were not abundant in Luzerne, Columbia, and Lycoming Counties on March 14 to 16. On March 15 green aphids (A. pomi) began to hatch in Adams County and on March 23 were becoming abundant.

New Jersey. M. D. Leonard (March 27): A few stem mothers of the apple grain aphid (R. prunifoliae) are just beginning to hatch at Ridgewood.

Virginia. A. M. Woodside (March 21): The rosy apple aphid (A. roseus) began hatching in the vicinity of Staunton on March 18 or 19. They are not abundant but there may be enough in some orchards to cause damage. Eggs of the apple grain aphid began hatching on March 16 or earlier.

Mississippi. C. Lyle (March 24): F. A. Smith reports that there was a medium infestation of Eriosoma lanigerum (Hausm.) on apple trees in Tate County on March 19 and D. W. Grimes observed this species on apple at Sallis, in Attala County, on February 25.

Missouri. L. Haseman (March 24): The eggs of the apple plant lice are beginning to hatch throughout central Missouri. The species does not show evidence of being very abundant.

APPLE LEAFHOPPERS (Cicadellidae)

Iowa. H. E. Jaques (March 21): The apple tree leafhopper is showing up rather abundantly in flight on warm nights.

Missouri. L. Haseman (March 24): Apple leafhoppers seem to have wintered perfectly throughout central Missouri.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Connecticut. P. Garman (March 23): This mite is more abundant than it was last year.

Pennsylvania. H. E. Hodgkiss (March 24): On March 14 to 16 red spider eggs were not abundant in Luzerne, Columbia, and Lycoming Counties.

PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Delaware. L. A. Stearns (March 23): The season is unusually early and the peaches are in full bloom in southern Delaware. Pupation of overwintered larvae is 28 percent, as compared with 3 percent on this date in 1937.

Georgia. C. H. Alden (March 19): The first pupa of the overwintered larvae was found on this date at Cornelia.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Virginia. A. M. Woodside (March 23): Plum curculios are fairly common along the edges of peach orchards in the Crozet section of Albemarle County. This is the earliest record of their entering the orchard in that section.

Georgia. C. H. Alden (March 21): The first hibernating beetles were caught today by jarring peach trees at Cornelia. Last year the first beetles were caught on April 13. This season is about 3 weeks ahead of 1937.

T. L. Bissell (March 22): A peach grower at Hampton reports a large number of these pests jarred from peach trees on March 21, but none has been found at Experiment. (March 26): Curculios are coming from hibernation in large numbers and growers have been spraying for more than a week in Spalding and Lamar Counties. The emergence is heavier than expected, considering the very light crop of peaches last year.

O. I. Snapp (March 22): Adults began to appear from hibernation on March 4 at Fort Valley, about 4 days after full bloom. They were appearing in numbers on March 15, when three-fourths of the petals had dropped, and they had reached the center of the orchards in numbers by March 22. An average of 3.6 beetles per tree were caught in one orchard on March 15, but the general infestation is not believed to be heavier than that of an average year. Eggs were forming in the bodies of some of the females caught on March 10 and there were mature eggs in the bodies of all females caught on March 15. (March 28): Larvae one-fourth grown were found in Elberta peaches today. Infestation about normal.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

New York. J. A. Evans (March): A number of pear psylla eggs had been laid by March 29.

Connecticut. E. P. Felt (March 24): Oviposition by the pear psylla has started.

PLUM

RUSTY PLUM APHID (Hysteroneura setariae Thos.)

Mississippi. C. Lyle (March 24): Plum twigs heavily infested were received from Tupelo, in Lee County, on March 19. It is reported that plum trees in Aberdeen are heavily infested with lice that probably belong to this species.

THISTLE APHID (Anuraphis cardui L.)

Idaho. R. W. Haegeler (March 2): The thistle aphid was found hatching on prune in southwestern Idaho early in March and most of the eggs hatched in the warmer districts on this date. The infestation seems general and indications are that control measures will be necessary to prevent severe damage. The situation is similar to previous ones when heavy infestations of this aphid on prunes have been observed in springs following unusually mild winters. The winter was one of the mildest on record.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

Missouri. L. Haseman (March 24): Grape leafhoppers seem to have wintered perfectly throughout central Missouri and in leafy and grassy harbors they are now present in swarms.

Arizona. C. D. Lebert (March 25): Adults were numerous on trumpet vines on a ranch west of Phoenix on March 10.

WALNUT

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Missouri. L. Haseman (March 23): In recent diggings in the vicinity of walnut trees that were completely stripped last fall little evidence of overwintering pupae have been seen, indicating that in spite of the terrible infestation last fall we will not have an unusually heavy winter carry-over.

CITRUS

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. H. Spencer (March 24): These aphids were numerous on orange and grapefruit trees around Haines City, in Polk County, central Florida, the first week in March. The outbreak was subsiding on March 15, when the Orlando district and the Okeechobee groves near Port Mayaca were becoming infested. In general over the State the infestation is rather spotted and less intense than in 1937. Around Orlando the Chinese ladybeetle (Leis dinidiatus F.) is appearing in larger numbers than in previous years and is the most important controlling factor. It was observed feeding also at floral nectaries of avocado trees.

COWPEA APHID (Aphis medicaginis Koch)

Arizona. C. D. Lebert (March 25): Several infestations of the burclover or cowpea aphid were observed on the terminal growth of citrus in the Phoenix area.

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Mississippi. C. Lyle (March 24): Cape-jasmine leaves infested with this pest have been received from correspondents in Holmes and Lowndes Counties recently. H. Gladney reports having observed several heavy infestations on citrus in Jackson and Harrison Counties during the last few weeks, and Jack Milton states that these insects are abundant on Cape-jasmine in Hinds County.

Louisiana. C. O. Eddy (March 20): Whitefly was reported on the wing last week for the first time.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (March 23): This mite is very numerous and much spraying is being done.

Louisiana. C. O. Eddy (March): Rust mites are reported common on citrus south of New Orleans.

CITRUS RED MITE (Paratetranychus citri McG.)

Florida. J. R. Watson (March 23): Purple mites appeared in the groves generally in March, considerably earlier than usual. The infestation is heavy over most of the State. Much spraying is being done.

California. H. J. Ryan (March 25): The citrus red mite declined somewhat in Los Angeles County in February, but there were still a good many citrus orchards at the end of the month with infestations heavy enough to warrant control measures.

SIX-SPOTTED MITE (Tetranychus sexmaculatus Riley)

Florida. H. Spencer (March 24): This mite is appearing in grapefruit groves in several citrus-growing sections. Affected leaves show the characteristic yellow spots.

PINEAPPLE

PINEAPPLE MEALYBUG (Pseudococcus brevipes Ckll.)

Florida. H. Spencer (March 24): Golden Abachi pineapple plants, which have been in the ground 3 years, were found to be heavily infested. Two species of ants, not yet identified, were associated with these insects. Many of the plants showed evidence of wilt and could be pulled out of the ground easily. The variety Red Spanish, nearby, was less seriously damaged.

COCONUT

DESTRUCTOR SCALE (Aspidiotus destructor Sign.)

Florida. E. W. Berger and Geo. B. Merrill (March 22): A very abundant build-up of the destructor scale on coconut palms has been observed at Fort Lauderdale, Broward County. Recent observations, however, reveal a high mortality.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Georgia. F. S. Chamberlin (March 31): Larvae of the vegetable weevil are causing some injury in a large tobacco plant bed at Amsterdam, Decatur County, in southwestern Georgia.

Florida. F. S. Chamberlin (March 25): Larvae have been found in a considerable number of tobacco plant beds in Gadsden County. Infestations were sufficiently heavy in a few beds to necessitate control measures. The insect is also abundant in vegetable gardens.

Mississippi. C. Lyle (March 24): This weevil has attracted considerable attention in the southern part of the State during the last few weeks. F. A. Smith reports that adults were abundant in the western part of Pike County on March 14. The first adults were observed in Harrison and Jackson Counties on March 15 and rather heavy damage, especially to turnips, has been caused. Correspondents in Simpson, Scott, Wilkinson, Jasper, and Stone Counties have sent specimens of adult weevils to this office during the past week, with the information that they were abundant on and seriously damaging potato plants,

Louisiana. C. O. Eddy (March): Adults were very abundant and destructive early in March.

California. H. J. Ryan (March 25): The larvae did considerable damage in February to cover crops of mustard and malva in a few citrus orchards in southern Los Angeles County.

R. E. Campbell (March 31): Many celery fields in southern Los Angeles County are infested; and the stalks show the characteristic feeding spots. From 1 to 8 larvae per bunch are present. If the infestation can not be reduced within a month much of the celery will be unmarketable.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Virginia. H. G. Walker and L. D. Anderson (March 25): Twelve-spotted cucumber beetles were observed feeding on a wide variety of host plants at Norfolk on March 22 and 24.

Georgia. T. L. Bissell (March 17): Beetles are abundant on peach blossoms and vetch in central Georgia.

Mississippi. C. Lyle (March 24): On February 21 a correspondent in Bolivar County reported injury to mustard, evidently caused by this insect.

Louisiana. C. E. Smith (March 26): The larvae started destroying young corn at Baton Rouge about March 20 and have been increasing. The activity of this pest is from 3 to 4 weeks earlier than in a normal year, doubtless because of prevailing mild temperatures since January 1.

FLEA BEETLES (Halticinae)

Michigan. E. I. McDaniel (March 23): Specimens of the pale-striped flea beetle (Systema taeniata Say), working on cabbage in a coldframe at East Lansing were brought in on March 22. This was a good-sized coldframe and the infestation was heavy.

Colorado. C. R. Jones (March 26): We have received a great number of hibernating flea beetles (Epitrix spp.) from Wheatridge and Arvada.

Utah. G. F. Knowlton (March 14): Hop flea beetles (Psylliodes punctulata Melsh.) are abundant on roadsides and foot hills near Garland.

CHANGA (Scapteriscus vicinus Scudd.)

Florida. J. R. Watson (March 23): About the usual number of complaints are coming in concerning mole crickets, chiefly the West Indian mole cricket.

POTATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Mississippi. H. Gladney (March 24): The beetle is somewhat numerous in Jackson and Harrison Counties. The first adults were noticed on March 7.

E. W. Dunnan (March 15): One beetle was found near the surface of garden trash in Leland, in the northwestern part of the State.

Louisiana. B. A. Osterberger (March 20): Adults, eggs, and larvae were noticed on potato plants in a field near Baton Rouge, East Baton Rouge Parish.

CABBAGE

IMPORTED CABBAGE WORM (Pieris rapae L.)

Virginia. H. G. Walker and L. D. Anderson (March 25): The butterflies have been ~~moderately abundant in~~ cabbage fields at Norfolk for the week and have been depositing a good many eggs.

Louisiana. C. O. Eddy (March): Adults have been abundant all month. Worms are abundant everywhere.

APHIDS (Aphididae)

Virginia. H. G. Walker and L. D. Anderson (March 25): A very small percentage of kale and cabbage plants at Norfolk are heavily infested with the cabbage aphid.

Georgia. O. I. Snapp (March 24): Aphids are rather abundant and are causing considerable damage to 5,000 cabbage plants set out in a field near Fort Valley, central Georgia.

Mississippi. C. Lyle (March 24): A correspondent at Columbia, Marion County, reported serious injury to spinach. L. J. Goodgame reported severe infestations on cabbage near Aberdeen.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. H. G. Walker and L. D. Anderson (March 25): A few bugs were observed feeding on collards on March 23 at Norfolk.

North Carolina. W. A. Thomas (March 19): Thousands of adults suddenly appeared on seeding mustard and cabbage at Chadbourn early in the week ending March 19. By the last of the week most of the seed stalks were dead or dying. They seemed to prefer the seed stalks to the foliage of younger plants growing in the same field.

Oklahoma. C. F. Stiles (March 25): The harlequin cabbage bug is quite numerous throughout the southeastern part of the State.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Iowa. H. E. Jaques (March 21): This pest seems to have passed the winter successfully in rather large numbers.

Nebraska. M. H. Swenk (March 21): A Douglas County correspondent reported the squash bug wintering in numbers in the feathery nest material of his martin house.

Kansas. H. R. Bryson (March 29): Squash bugs were reported to be numerous in the vicinity of Manhattan.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Louisiana. P. K. Harrison (March 24): This aphid is becoming less abundant at Baton Rouge, owing to the reduction by natural enemies.

SPINACH

GREEN PEACH APHID (Myzus persicae Sulz.)

Virginia. H. G. Walker and L. D. Anderson (March 25): Spinach aphids are rather abundant in a great many fields of early spinach at Norfolk but are rather scarce in the younger spinach. A fungous disease has killed from 50 to over 75 percent of the aphids in some of the fields.

STRAWBERRY

STRAWBERRY WEEVIL (Anthonomus signatus Say)

North Carolina. W. A. Thomas (March 21): The weevils from hibernation began entering the strawberry fields on March 15 and by March 21 had spread over most of the fields of older berries in the Chadbourne area. The sudden advent of spring has resulted in a mass emergence of the weevils from hibernation, causing a sudden infestation to develop much earlier than usual.

SUGAR BEETS

SUGAR-BEET WIREWORM (Limonius californicus Mann.)

California. M. W. Stone (March 23): Considerable damage to sugar beets in Orange County occurred in March. Because of the thinned-out fields, two beet growers replanted over half of their total acreage. Counts made on March 18 showed an average of 1 larva per foot of row and as high as 13 larvae attacking a single plant.

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Texas. F. L. Thomas (March 21): On January 19 this insect was found on spinach and sugar beet at Iowa Park, Wichita County, on January 3 at Weslaco and on February 9 at Elsa, Hidalgo County, on spinach.

Utah. G. F. Knowlton (March 14): Adults are moderately abundant on the filaree foothills southwest of Garland, in Box Elder County.

TOBACCO

TOBACCO FLEA BEETLE (Epitrix parvula F.)

Virginia. W. J. Shoene (March 21): Beetles have emerged in small numbers at Chatham on March 19.

South Carolina. N. Allen (March 19): Injury to plants in beds has been very light. This conforms to the results of emergence in hibernation cages which began early in February. The present season has been abnormally dry and it appears that this may have affected emergence from hibernation.

Tennessee. L. B. Scott (March 25): At Clarksville many plant beds were found to be infested on March 19. The beetles appeared 2 weeks earlier than last year and in much greater numbers. Some beds in which seed had not germinated were found to be infested, indicating that the plants will be damaged as soon as they appear above ground.

GREEN JUNE BEETLE (Cotinis nitida L.)

South Carolina. N. Allen (March 19): In making a survey of tobacco beds in portions of Marion, Horry, Florence, and Williamsburg Counties, it was found that larvae had injured some beds on 10 of the 21 farms visited. In some instances, nearly half of an infested bed was injured. Injury was found only on those bed sites that had been used for more than a year.

TOBACCO BUDWORM (Heliothis virescens F.)

Florida. F. S. Chamberlin (March 31): Larvae are very abundant on newly set tobacco plants in Gadsden County.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

Georgia. T. L. Bissell (March 26): One boll weevil was jarred from peach at Pomona, in central Georgia.

BOLLWORM (Heliothis obsoleta F.)

Texas. K. P. Ewing and R. L. McGarr (March): Two bollworm moths were collected on corn in the vicinity of Robston on March 11, and five moths were collected in a field of alfalfa and clover at Wharton on March 15. Although no bollworm eggs were found, they were probably being laid on corn in these localities.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (March): Several pink bollworm pupae were found in February in cotton bolls left on the surface of the ground at Presidio. Moths began emerging during the first half of March, which is unusually early for this locality.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Texas. F. L. Thomas (March 21): The first flea hopper nymphs have been found as far north as Falls County, in central Texas. No adults have been taken on screen traps in Brazos County.

Texas. K. P. Ewing and R. L. McGarr (March): Nymphs hatched from overwintering flea hopper eggs in hibernation cages at Port Lavaca on February 12. On the same date first- and second-instar nymphs were collected on croton in Calhoun County. Adults were collected on croton during the week of March 5. This is the earliest we have ever found adults in eastern Texas.

J. C. Gaines (March): Three adults and several nymphs were collected on flight screens at College Station on March 25. These are the first adults collected this year at this point.

Correction.--The beet armyworm (Laphygma exigua Hbn.) was erroneously given as L. frugiperda S. and A., in the Insect Pest Survey Bulletin for July 1, 1937 (vol. 17, no. 5, p. 257).

F O R E S T A N D S H A D E - T R E E I N S E C T S

CANKERWORMS (Geometridae)

New Jersey. M. D. Leonard (March 27): Many trees examined on March 20 at Ridgewood showed only four or five males and no females of the spring cankerworm (Paleacrita vernata Peck). The weather was very mild and on March 19 from six to eight males appeared at the window. On March 27 no adults could be found, the weather being cooler (about 50° F.).

Pennsylvania. H. E. Hodgkiss (March 24): Moths of the spring cankerworm were flying at State College on March 17.

Ohio. T. H. Parks (March): Male moths of the spring cankerworm were seen flying among elm trees, and wingless females were present on elm twigs on March 20. The males have been flying for the last 3 weeks. A heavy outbreak is anticipated.

Illinois. W. P. Flint (March 22): Adults of the cankerworm continue to be abundant in the western part of the State. For more than a month males have been observed on the wing.

Iowa. C. J. Drake (March 25): Males of the spring cankerworm are being attracted to lights in tremendous numbers throughout most of the State.

H. E. Jaques (March 21): Spring cankerworm adults are showing extraordinary abundance this spring. Reports are coming in of several hundred females being caught in the bands of one tree and numerous complaints are made of the annoyance caused at night by large numbers of male moths entering dwellings and stores.

Missouri. L. Haseman (March 24): At Columbia during the last week I have seen more male spring cankerworm moths than I have ever seen in any similar length of time in the 30 years I have been connected with the Department. Apparently we are to have a real tussle with spring cankerworms in central Missouri this year.

Nebraska. M. H. Swenk (March 21): In the southeastern part of the State considerable activity of moths of the spring cankerworm was noted during the period from March 10 to 20.

Kansas. H. R. Bryson (March 29): Cankerworms were noticeably absent on banded trees over the usual area in eastern Kansas. Heavy flights at Manhattan occurred on March 15 and 17.

Oklahoma. R. G. Dahms (March 26): The spring cankerworm is completely stripping the foliage of apple trees in many small orchards that have not been sprayed. (Reported from the State field station at Lawton, Comanche County, in southwestern Oklahoma.)

FALL WEBWORM (Hyphantria cunea Drury).

Louisiana. C. O. Eddy (March): The first adults were seen at Baton Rouge on March 20.

FIR

A TORTRICID (Epinotia meritana Heinr.)

Utah. D. De Leon (March 25): The outbreak first observed last year in Powell National Forest has caused serious defoliation to white fir (Abies concolor) and appears to be as heavy, if not heavier, than in 1937.

LARCH

LARCH CASEBEARER (Coleophora laricella Hbn.)

New York. R. E. Horsey (March 19): A number of live larvae in their overwinter cases were found on Larix americana at Rochester. The larch was still dormant and the larvae had not begun to feed.

OAK

GOUTY OAK GALL (Andricus punctatus Bass.)

New York. E. P. Felt (March 24): This gall insect was extremely abundant on oak at Pelham Manor in March. A number of the galls had been partly eaten away by squirrels in their desire to get the grubs.

PINE

WHITE-PINE WEEVIL (Pissodes strobi Peck)

New York. E. P. Felt (March 24): The unseasonably warm weather of March 21-23 has brought out the adults.

WALNUT SCALE (Aspidiotus juglans-reginae Comst.)

Pennsylvania. E. P. Felt (March 24): This scale was reported as abundant on Scotch pine in the Philadelphia area during March.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Colorado. C. R. Jones (March 26): Numerous requests have come to this office for the control of the pine leaf scale.

Utah. G. F. Knowlton (March 21): Austrian pine on the Utah State Agricultural College campus at Logan has been heavily infested.

POPLAR

CALIFORNIA TENT CATERPILLAR (Malacosoma californica Pack.)

Arizona. C. D. Lebert (March 25): A few colonies were observed on cottonwood trees in the northeastern Phoenix area.

WILLOW

CARPENTER WORM (Prionoxystus robiniae Peck)

North Dakota. J. A. Munro (March 21): These pests caused severe injury to a planting of willows at Mott, in Hettinger County. They were also reported on American elm at Park River; Walsh County.

I N S E C T S A F F E C T I N G G R E E N H O U S E
A N D O R N A M E N T A L P L A N T S

CABBAGE LOOPER (Autographa brassicae Riley)

Louisiana. C. E. Smith (March 26): Snapdragons and calendulas growing under glass at Baton Rouge were severely injured during February and March.

A WHITEFLY (Aleyrodidae)

Virginia. H. G. Walker and L. D. Anderson (March 25): Whiteflies are reported as very abundant on gardenias in Norfolk.

OYSTERSHELL SCALE (Lepidosaphes ulni L.)

New York. R. E. Horsey (March 21): A small amount of this scale was discovered on two vines of Vitis longi in an ornamental planting in Rochester. An examination under the microscope showed that the eggs came through the winter uninjured.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Arizona. C. D. Lebert (March 25): On March 15 severe infestations were reported on ornamentals at Patagonia, Nogales, and Phoenix. Scattered light infestations on citrus appeared in the Phoenix area.

ARBORVITAE

ARBORVITAE APHID (Lachnus thujaefilina Del G.)

Oklahoma. R. G. Dahms (March 26): This aphid is very abundant on arborvitae. (Reported from the State field station at Lawton, Comanche County, in southwestern Oklahoma.)

AZALEA

AZALEA SCALE (Eriococcus azaleae Comst.)

Mississippi. C. Lyle (March 24): Azalea leaves infested with this pest were received from Clark County on February 24. H. Gladney reports that two azalea plants were found infested in Harrison County a short time ago.

CATALPA

COMSTOCK'S MEALYBUG (Pseudococcus comstocki Kuw.)

Michigan. E. I. McDaniel (March 23): Specimens of the catalpa mealybug were received on March 23. In the past this species has not been common with us.

CHRYSANTHEMUM

CHRYSANTHEMUM APHID (Macrosiphoniella sanborni Gill.)

Arizona. C. D. Lebert (March 25): The chrysanthemum aphid was observed on March 20 on several plantings in the Phoenix area, and was very numerous on 2 or 3 inches of terminal growth. The plants were completely infested with aphids in several plantings.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

Mississippi. C. Lyle (March 24): J. Milton reports that this insect is very abundant on and has caused serious damage to many euonymus plants in the vicinity of Jackson. Specimens on euonymus were received from Booneville, in Prentiss County, on March 8.

HOLLY

HOLLY LEAF MINER (Phytomyza ilicicola Loew)

Virginia. C. R. Wiley (March 21): This pest is apparently more abundant in the Richmond area than usual. A number of requests have been received for control remedies. We have seen a number of individual

trees and at least one hedge heavily infested. Pupation must have begun about March 1, as all of the 20 or 30 individuals examined on March 14 had pupated. Leaves are falling, but whether this is caused by the miner or is the natural shedding, I am not sure.

CEDAR

JUNIPER WEBWORM (Dichomeris marginellus F.)

Delaware. L. A. Stearns (March 23): Infestation is reported on cedar at Seaford.

OLEANDER

OLEANDER CATERPILLAR (Syntomeida epilais Walk.)

Florida. J. R. Watson (March 23): The oleander caterpillar is working in all sections from Gainesville south.

ROSE

ROSE APHID (Macrosiphum rosae L.)

Virginia. C. R. Wiley (March 21): This aphid has been present on roses in Richmond for 2 months; recent warm weather has apparently stimulated reproduction and now the young rose shoots are very heavily infested. I noticed a species of syrphid fly hovering over my rose bushes when I sprayed them March 19. A Danville, Va., nurseryman was in the office on March 21 and he was impressed with the abundance of aphids on roses and Japanese barberry in Richmond. He stated that they were unusually scarce in Danville at that time.

Louisiana. B. A. Osterberger (March 16): A green aphid has so seriously infested rose bushes that many of the roses are not opening normally.

I N S E C T S A T T A C K I N G M A N A N D
D O M E S T I C A N I M A L S

MAN

MOSQUITOES (Culicinae)

Florida. B. V. Travis (March 2): The mosquitoes (Anopheles quadrimaculatus Say) that have been so abundant around the house all winter in Tallahassee, are now seen only rarely. (March 17): Still present but few in number. A. crucians Wied. has been rather numerous around the outside of the house for the last 2 weeks.

Mississippi. E. W. Dunnam (March 23): Mosquitoes have been noticed attacking people about dusk in the vicinity of Ieland. Some have been observed feeding on the legs of cattle before this time of day.

Missouri. L. Haseman (March 24): Within the last 10 days mosquitoes have begun to show up. One unusually large, undetermined species has been especially noticeable in bedrooms in central Missouri.

EYE GNATS (Hippelates spp.)

Georgia. A. L. Brody (March 25): There has been an increase in abundance during the past months. Eye gnats became slightly annoying to humans on March 15 and were noted as very active and abundant on March 18.

DEER FLIES (Chrysops spp.)

Georgia. J. B. Hull (March 26): These flies began to appear in Savannah the middle of March, in small numbers, in and around marshes.

SANDFLIES (Culicoides sp.)

Georgia. J. B. Hull (March 26): The annual spring emergence has been greater in the vicinity of Savannah this year than in any of the last 5 years.

CHIGGER (Trombicula irritans Riley)

Florida. B. V. Travis (March 29): We noticed a few attached to us on March 20.

TROPICAL RAT MITE (Liponyssus bacoti Hirst)

Oregon. D. C. Mote (March 3): Specimens of mites were sent from North Bend, where they were emerging from a very narrow crack in the wall.

California. R. H. Smith (January 20): This mite presumably has been the cause of considerable discomfort to persons in Los Angeles.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Massachusetts. C. N. Smith (March 25): The first adults were taken this season on March 21 on Marthas Vineyard Island. One male was found on my clothing while I was looking for ticks. Five males and five females were taken from a dog before they had become attached and several specimens were taken from another dog. Each of the three lots was taken by a different collector in different localities, all on March 21. The temperature reached 68° F. at this time, the first day since fall that it has been over 60°. No larvae or nymphs have been collected this spring.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

Georgia. A. L. Brody (March 29): An infested hog near Quitman was reported on January 21. A farmer also reported another case in his locality about the middle of February.

Texas. D. C. Parman (March 25): Screwworm flies (C. americana) were practically exterminated during the summer of 1937 in the southern areas in Texas where traps have been operated, at Catarina, Laredo, Hebbronville, Alice, and Three Rivers. In no catch since August 1937 have there been more than one or two flies in any of these traps, none has been taken since December, and only one in December. The trappings have indicated that weather conditions have been very favorable for build-up of C. macellaria. There were 15 quarts of flies taken at Laredo in January, practically 87 percent of which was this species. In February the traps at Laredo, Hebbronville, and Alice took 21, 26, and 19 quarts of flies, respectively, and approximately 90 percent of these were C. macellaria.

Arizona. C. C. Deonier (March 25): Screwworms were taken at Bumble Bee and Wichenburg during the latter half of January and at Hassayampa during the first part of February. They were also taken at Nogales and Tempe during the latter half of February. A considerable outbreak of these pests was indicated by examination in the Yuma area on February 17, infestations being as high there as 20 to 30 percent. A few cases of screwworms have been reported throughout the area worked during the winter.

STABLEFLY (Stomoxys calcitrans L.)

Georgia. A. L. Brody (March 25): These flies were first noted at Valdosta during the first week in February, when from 10 to 15 adults per animal were seen. The flies were usually found on the lower

half of the legs. This species increased to 25 per animal the middle of February and in March from 25 to 50 per animal. The steers at the farm have been considerably annoyed by stableflies during the last month. Often it was difficult to drive them from the tall gallberry bushes among which they stood for the slight protection against the flies.

Mississippi. E. W. Dunnan (March 15): The stablefly has been breeding off and on all the winter.

CATTLE GRUBS (Hypoderma spp.)

Georgia. A. L. Brody (March 25): Larvae of the cattle grub (Hypoderma probably lineata DeVill.) were still appearing in the backs of steers during the latter part of February. The last recorded removal was made on February 24. The greatest appearance of warbles has been noted from the second week in November 1937 to the second week in January 1938.

Iowa. R. W. Wells (March 29): Cattle grubs (H. lineatum and H. bovis Deg.) are more abundant this year than during the preceding 3 years, as judged by examinations made of cattle in the counties of Story, Boone, Warren, and Clayton. In Warren County all of the 30 larvae of H. lineatum taken from 3 head of cattle were in the third or final instar. Apparently no grubs had dropped from these cattle on March 22, when the examinations were made. In Clayton County on March 23, 291 grubs were taken from cattle and 52 percent of them were in the second instar. The presence of a few grubs in the first instar indicated that not all of the larvae had reached the backs.

Missouri. L. Haseman (March 24): Recent investigations on ox warble control have revealed the fact that throughout central and north-central Missouri generally our common warble has been maturing ahead of schedule. Practically all of the warbles, where the animals were not treated, have already escaped from the backs of cattle. A few specimens, not over half-grown, taken during the past week, seem to be individuals of the northern later maturing species.

HORN FLY (Haematobia irritans L.)

Georgia. A. L. Brody (March 25): Horn flies were first observed to be active on February 8, at which time less than 10 flies per animal were noted. The number per animal increased to 50 flies during the middle of February, and to 150 by the middle of March. It was interesting to note that on all occasions when observations were made more flies were seen on dark- than on light-colored animals.

GREENBOTTLE FLIES (Lucilia spp.)

Georgia. A. L. Brody (March 29): Five infestations of larvae of Lucilia spp. were found in artificially wounded animals at the experimental farm near Valdosta. The county agent in Lowndes County reported infestations of maggots in a hog at Hahira the middle of March and in another near Valdosta.

CATTLE BITING-LOUSE (Bovicola bovis L.)

North Dakota. J. A. Munro (March 21): Biting lice of cattle have been rather commonly reported from herds in various parts of the State.

Iowa. R. W. Wells (March 29): Cattle in the central part of Iowa were exceptionally free from cattle lice during the past winter, as judged from the results of visits to about 50 farms. Only a few light infestations were found, even on farms that had heavier infestations during the previous year.

LONG-NOSED CATTLE LOUSE (Linognathus vituli L.)

Iowa. R. W. Wells (March 29): Cattle in the central part of the State were exceptionally free from lice but, of the bloodsucking lice found, L. vituli was the most common.

GULF COAST TICK (Amblyomma maculatum Koch)

Georgia. A. L. Brody (March 25): A few nymphs were found on meadow larks caught in a field. Four males of this species remained attached to sheep throughout the winter until March 10. A week later only one of these males was still attached.

HORSE

BUFFALO GNATS (Eusimulium spp.)

Mississippi. C. Lyle (March 24): F. A. Smith states that buffalo gnats were observed in the western part of Tate County about January 20, and W. L. Douglass reports that a few of these gnats were observed last week in the western part of Calhoun County.

C. C. Smith (March 12): Buffalo gnats (E. neogrumm Wilky) are beginning to give considerable trouble along the Tallahatchie, Coldwater, and Lacourse Rivers in Leake, Greene, Tallahatchie, Quitman, and Tunica Counties. The situation is not as serious as it was in 1933, but many people are beginning to use smudges and gnat oil.

HORSE BITING-LOUSE (Trichodectes equi L.)

North Dakota. J. A. Munro (March 21): Reports of biting lice of horses have come from Max, in McLean County, and Clement and Fullerton, in Dickey County, during the last month.

SHEEP

SHEEP BOTFLY (Oestrus ovis L.)

Georgia. A. L. Brody (March 25): On February 15 one full-grown larva of the sheep nose bot dropped naturally from the nose of a sheep. On March 17 a live adult was found resting on a screened cage at the Experimental Farm at Valdosta.

Utah. G. F. Knowlton (March 26): Inquiries concerning grubs in the heads of sheep were received from various parts of Utah, together with reports of injury.

A GOAT LOUSE (Linognathus sp.)

Georgia. A. L. Brody (March 19): Young goats at the Experimental Farm at Valdosta are heavily infested with blue lice. Collections were made from infested animals on February 14.

BLACK-LEGGED TICK (Ixodes ricinus scapularis Say)

Georgia. A. L. Brody (March 25): A few adults were still attached to sheep.

HOGS

HOG LOUSE (Haematopinus suis L.)

Tennessee. G. M. Bentley (March 15): This louse has been reported on hogs at several points in the State.

H O U S E H O L D A N D S T O R E D - P R O D U C T S I N S E C T S

TERMITES (Reticulitermes spp.)

Connecticut. N. Turner (March 24): Flights of R. flavipes Koll. began indoors in January and occurred outside during the last week. The usual large number of infested buildings was reported.

Pennsylvania. E. J. Udine (March 23): At Carlisle winged forms of termites are emerging from the outside window sills and frames in an old stone house and some damage has been done to the wooden foundation sills in the basement. As the tunnels are in the mud plaster, the situation is hard to control.

- Ohio. T. H. Parks (March): More than the usual number of reports of termites swarming have reached us during the extremely warm periods of the last week.
- Indiana. E. V. Walter (March 21): Termites were issuing from holes in the side of a building at La Fayette on March 21, when the temperature was about 69° F.
- Illinois. W. P. Flint (March 22): Since the middle of March these insects have been swarming over the southern half of the State, and many swarms have been appearing in heated buildings in central Illinois.
- Tennessee. G. M. Bentley (March 21): Several swarms of termites (R. flavipes) have been reported in Knox and Bradley Counties in the neighborhood of Knoxville and Cleveland. It is evident that in other counties similar swarms are taking place. The termite situation in Tennessee is getting worse each year.
- L. B. Scott (March 25): Termites appear to be more troublesome than usual. Many inquiries were received during March from people who noticed swarms of termites in and near their homes at Clarksville. Damage appears to be slight.
- Missouri. L. Haseman (March 24): Since about the middle of the month half a dozen swarms of termites at Columbia have been reported. Most of these have emerged in basements or inside the house but one or two have been reported as emerging outside.
- Nebraska. M. H. Swenk (March 21): Termites (R. tibialis Banks) were reported as damaging a house in Buffalo County and destroying a wind-break of Austrian pine and Chinese elm trees in Cass County on March 3 and 18, respectively.
- Texas. F. L. Thomas (March 21): Termites were found at Temple, Bell County, on February 18.
- Utah. G. F. Knowlton (March 21): Winged termites have been observed flying on warm days recently.

ANTS (Formicidae)

- Connecticut. N. Turner (March 24): The pavement ant (Tetramorium caespitum L.) is increasing in abundance in houses. It is commonly found nesting under concrete basement floors or outside of foundations.
- Florida. B. V. Travis (March 2): The activity of the fire ant (Solenopsis geminata F.) is only slight in Tallahassee, owing to prevailing low temperatures.

Mississippi. C. Lyle (March 24): J. Milton reported on February 25 that Camponotus caryae rasilis Wheeler was infesting a house in Jackson. This species was also reported from Yazoo City on March 19. Many complaints have been received from various localities throughout the State about fire ants (S. xyloni McCook) in gardens and other places.

BOXELDER BUG (Leptocoris trivittatus Say)

Iowa. H. E. Jaques (March 21): This bug has been the cause of many serious complaints because of its annoyance in houses.

Nebraska. M. H. Swenk (March 21): Boxelder plant bugs were reported as abundant and troublesome in March in and around houses in the Missouri River counties from Douglas to Thurston.

Kansas. J. R. Horton (March 28): At Wichita this insect has passed the winter successfully in large numbers on the sides of houses, tree trunks, and other places.

H. R. Bryson (March 29): After 5 or more years of comparative scarcity, boxelder bugs are more abundant than usual. Large clumps were observed on the southern exposure of a bluff on February 22. Reports of annoyance have come from Manhattan and a few other localities.

Nevada. Geo. G. Schweis (March 22): We have had a number of calls recently about the presence of boxelder bugs in such numbers as to become annoying to some of our residents.

Utah. G. F. Knowlton (March 18): Boxelder bugs have survived the winter in large numbers at Logan, and are annoying people in homes, school-houses, and offices.

CLUSTER FLY (Pollenia rudis F.)

Indiana. P. Luginbill (March 16): The cluster fly has been reported near La Fayette as very abundant in a dwelling, and causing great annoyance.

AN ANOBIID (Xestobium rufovillosum Deg.)

Connecticut. N. Turner (March 24): There have been more reports than usual of these beetles attacking timbers in buildings.

A SPIDER BEETLE (Ptinus tectus Boieldieu)

Oregon. M. H. Hatch and B. G. Thompson (January): At Portland this pest was found attacking dried fish and in great numbers on the buds of trees.

ORIENTAL COCKROACH (Blatta orientalis L.)

Michigan. E. I. McDaniel (March 23): A bakery heavily infested with the oriental roach was treated. We have a few local infestations in Lansing, but this roach is not general with us.

CLOVER MITE (Bryobia praetiosa Koch)

Colorado. R. G. Richmond (March 23): During the last month almost daily calls have come in regarding the control of this pest. The mite is invading houses in large numbers and is a real household nuisance in food, dishes, and bedding in the Denver area.

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THE MORE IMPORTANT RECORDS FOR APRIL

The outstanding event of the month was the outbreak of the armyworm and the variegated cutworm in northwestern Mississippi, northeastern Louisiana, and east-central Arkansas. Oats and alfalfa were the principal crops injured.

The unseasonably cool rainy weather the second week in April and the continued unfavorable weather delayed hatching of grasshopper eggs over much of the infested territory; however, some hatching has taken place in Utah, southeastern Colorado, and northwestern Texas, and is practically complete in Oklahoma and Missouri.

Eggs of the Mormon cricket have hatched throughout Montana.

Damage by cutworms was reported from many localities, the most injurious being the variegated cutworm in the Delta counties of Mississippi and Louisiana and the army cutworm in western North Dakota.

May beetles were observed at lights as far north as Chadbourn, N. C., La Fayette, Ind., and Kansas. Only moderate injury was reported generally but pecan buds in Georgia were severely injured. Injury by the grub of the green June beetle occurred in Kentucky, Tennessee, and Georgia.

The spring brood of the hessian fly is emerging in Indiana. The insect in the pupal stage withstood abnormally low temperatures in Kansas the second week of the month. The infestation in Pennsylvania is light generally.

The chinch bug has passed the winter successfully but has been slow in leaving winter quarters. The first noticeable flights occurred during the last 10 days of the month in Indiana, Illinois, and Missouri.

The survival of pupae of the corn ear worm, or bollworm, in cages in New Jersey, Virginia, Ohio, and Texas was higher than in 1937, and in Kansas survival was recorded for the first time, cages having been run for 4 years. The insect also survived in Utah.

The pea aphid is appearing on alfalfa and peas along the Atlantic coast from Virginia to New Jersey. A few pea fields on the Eastern Shore of Virginia are heavily infested. The insect is increasing rapidly in the pea fields of southern Wisconsin. On the Pacific coast the survival was high, but cold wet weather in March delayed reproduction until April, when the insect became numerous on alfalfa and Austrian field peas in Oregon and California.

The codling moth is pupating generally over the country and adults were observed as far north as Indiana. Mortality in Washington is very low.

The eastern tent caterpillar is very abundant from New Hampshire to South Carolina and westward to Tennessee.

Apple aphids hatched rather abundantly, but many were killed in Connecticut, New York, and Pennsylvania by cold weather. An outbreak of the rosy aphid is developing in southern Indiana and western Kentucky.

The vegetable weevil is more abundant and destructive in Alabama, Mississippi, and Louisiana than usual. A new infestation, several miles from the known infested area, was reported from Texas. The insect is unusually destructive in southern California.

The Colorado potato beetle is abundant from Virginia, through North Carolina and Mississippi, to Louisiana.

The Mexican bean beetle is coming out of hibernation in the Norfolk district, the first one being taken on beans in the field on April 11, which is 9 days earlier than ever before recorded in that locality. Winter mortality in Colorado is 39 percent; normal mortality is between 60 and 70 percent.

The harlequin bug is appearing in great abundance as far north as Chadbourn, N. C.

The potato leafhopper was taken at trap lights at Arlington, Va., 2 weeks earlier than previously recorded.

The tomato worm is appearing earlier than usual in the tobacco district of northwestern Florida.

Cold weather has delayed planting and has killed much cotton that was planted early. Planting has also been delayed by drought in some areas and by too much rain in others. The cold dry weather in April has delayed the emergence of boll weevils in many places. By the end of the month weather conditions favored the growth of cotton and the weevils were reported as moving into the fields.

Early in the season the cotton flea hopper appeared in great abundance, but it received a set-back by the cold weather and at present is no more than normally abundant.

The great number of reports of abundance of cankerworms indicate that the insect is occurring in outbreak form in the Middle Atlantic States from New Hampshire to South Carolina, also in Ohio and Mississippi.

The forest tent caterpillar is reported in abundance in South Carolina and Mississippi.

An introduced aphid, Myzus ornatus Laing, is occurring in abundance at Berkeley, Calif., and has been discovered in Los Angeles County.

Dialeurodes chittendeni Laing is being reported from Connecticut for the first time.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Connecticut. A. W. Morrill, Jr. (April): Reports were received on April 15 that springtails had been eating newly sprouted tobacco seedlings in plant beds at Windsor, in west-central Connecticut, for about a week. On April 23, 15 or 20 specimens were brought in and proved to be very young nymph grasshoppers, probably Melanoplus femur-rubrum (Deg.). Also on the 23d, egg pods were discovered in the ground adjoining beds containing grasshopper nymphs almost fully developed.
- Florida. J. R. Watson (April 23): Lubberly grasshoppers, Romalea microp-tera (Beauv.), have been very abundant in Clay and adjoining counties, doing damage particularly to bulbs of amaryllis, narcissus, iris, and other plants. They began appearing in large numbers late in March and most of them are now in the second and third instars.
- Minnesota. A. G. Ruggles (April 19): Eggs have not hatched yet to any extent. A few nymphs of Chortophaga sp. have been found.
- Missouri. L. Haseman (April 25): During the first days of April in some of the southern counties and since the middle of the month at Columbia, the lesser migratory grasshopper (M. mexicanus Sauss.) has been hatching and, in places, great numbers have hatched and are beginning to feed.
- Nebraska. M. H. Swenk (April): A report, with specimens, from Holt County indicated that Hippiscus rugosus Scudd., C. viridifasciata Deg., and Arphia xanthoptera Burm. were found attacking young alfalfa in that county. Specimens of mites, Eutrombidium trigonum Hermann, were received from Douglas County on April 2, with the report that they were very numerous, presumably feeding chiefly on grasshopper eggs.
- Oklahoma. C. F. Stiles (April 30): Eggs are hatching in all parts of the State, and hoppers are doing a little damage in a few counties. The percentage of hatch varies from 10 to 75.
- Texas. F. L. Thomas (April 22): Grasshoppers continue to be a potential menace in northwestern Texas. Snow probably aided in protecting those that had already hatched.
- Montana. H. B. Mills (April 20): Several reports have been received of hatching of grasshoppers, but those that have been investigated have disclosed nymphs of the overwintering C. viridifasciata.
- Colorado. S. C. McCampbell (April 19): Men are making surveys of egg beds in migratory grasshopper (Dissosteira longipennis Thos.) area. We will have an infestation involving something over 4,000,000 acres of this species. Eggs are developing very slowly, owing to spring rains and snows. It is estimated that it will be 3 weeks before this species hatches.

Utah. G. F. Knowlton (April 16): Eggs are abundant and in good condition west of Ephraim, in Sanpete County, central Utah, and near Trenton, in Cache County, northern Utah. Little hatching has occurred, as repeated snow storms stopped hatching about the middle of March.

MORMON CRICKET (Anabrus simplex Hald.)

Montana. H. B. Mills (April 20): Mormon crickets are hatching generally throughout the State, and field work on control will probably start before the end of April.

CUTWORMS (Noctuidae)

New York. N. Y. State Coll. Agr. News Letter (April 25): The well-marked cutworm (Agrotis unicolor Walk.) was found on April 18, feeding on spinach in Nassau County.

New Jersey. J. B. Schmitt (April 22): Cutworms are abundant in rubbish in and around fields. Some plants have been destroyed in coldframes.

Virginia. W. J. Schoene (April 20): Climbing cutworms are very common on peach trees.

H. G. Walker and L. D. Anderson (April 26): Cutworms are moderately abundant in some fields at Norfolk.

Georgia. T. L. Bissell (April 25): A correspondent sent in 15 specimens of Lycophotia margaritosa saucia Hbn. from 1 tomato plant in a greenhouse at Clarkston. They were eating fruits. Since February 13, 14 moths have been taken in light traps at Experiment and 6 on March 23.

C. H. Alden (April 20): Cutworms have cut off about one-sixth of the tomato plants set out in the last week at Cornelia. These are much more injurious than last year.

Florida. F. S. Chamberlin (April 5): Cutworms caused relatively little damage in fields of newly set tobacco this season in Gadsden County.

Alabama. J. M. Robinson (April 23): These pests have attacked onions, cabbage, and tomato plants to a great extent in central and southern Alabama.

Mississippi. C. Lyle (April 21): H. Gladney of Ocean Springs reported that he had observed damage to tomatoes, beans, and corn in Jackson County, and N. D. Peets, of Brookhaven, indicated that cutworms were numerous in gardens and flower beds in his districts. Numerous reports from the Delta counties indicate the heaviest infestation of variegated cutworm (L. margaritosa saucia) in several years. Much damage is being done to all winter cover crops. As many as 20 or 30 worms under a single bur-clover or alfalfa plant were reported in some instances. Some alfalfa is being destroyed by mixed infestations of the armyworm (Cirphis unipuncta Haw.) and the variegated

cutworm, which is very abundant in alfalfa, bur-clover, and other cover crops.

Louisiana. R. C. Gaines (April 21): While in East Carroll Parish on April 20, we visited a 62-acre field of bur-clover which had been completely destroyed by cutworms.

Tennessee. L. B. Scott (April 1): Several cutworms per square foot were noted in many pastures in Montgomery County on March 30. Several cases of severe damage have been noted in tobacco plant beds. It is not uncommon to find five cutworms per square foot in pastures. Observations indicate an unusually severe infestation in north-central Tennessee. It is much more severe than the heavy infestation in 1937. Damage is particularly severe to corn, tomatoes, tobacco-plant beds, and strawberries.

Kentucky. W. A. Price (April 27): Claybacked cutworms (Feltia gladiaria Morr.) are present in large numbers and are causing much damage to young tobacco plants in the bed and to clover and alfalfa. They seem to be generally distributed over the State.

Michigan. R. Hutson (April 25): Cutworms are abundant in Berrien County about St. Joseph, in Van Buren County at Paw Paw, and in Manistee County. The species reported at Manistee is A. unicolor.

Missouri. L. Haseman (April 25): Cutworm moths accompanied the flights of armyworm moths during the first part of the month, but they were less abundant than the latter. To date, no complaints of cutworms have been received, but the partly grown cutworms are abundant in the sod. Variegated cutworms bred from eggs in the laboratory are now nearly full-fed.

Arkansas. W. F. Turner (April 15): Peaches in Cross County are being injured by climbing cutworms.

North Dakota. J. A. Munro (April 16): Infestations of the army cutworm (Chorizagrotis auxiliaris Grote), though spotted, are heavy enough to indicate serious injury to crops as soon as plants are above ground. Reports have been received from five or six of the western counties.

Kansas. H. R. Bryson (April 25): The moths of C. auxiliaris were abundant at lights during the second and third weeks of April. The larvae did not cause much injury to crops because the garden crops in most localities were not up. They were reported causing injury to oats at Republic.

Kansas. H. R. Bryson (April 25): Eriopyga incincta Morr., Parastichtis bicolorago Guen., and Feltia venerabilis Walk. were observed destroying the leaves of reclaimed sand-dune land at Manhattan. The last was also found in gardens.

Oklahoma. C. F. Stiles (April 30): Armyworms are generally distributed over the southern part of the State.

- Texas. F. L. Thomas (April 20): Cutworms have been severe in general. They appeared early and damaged wheat in Baylor County. One farmer lost 35 acres. Cutworms were abundant throughout March on lettuce, potatoes, corn, and strawberries in Galveston County.
- Colorado. G. M. List (April 23): The western army cutworm (C. auxiliaris) is doing noticeable damage in some alfalfa fields in Larimer County. Two specimens of Porosagrotis orthogonia Morr. were brought in from a 30-acre field in Adams County in which the wheat had been destroyed.
- Utah. G. F. Knowlton (April 25): Cutworms are abundant in the sandy cultivated land from Lakeview to Pleasant Grove, in Utah County. Alfalfa is suffering most from their attack.
- C. J. Sorenson (April 22): Moderately abundant in alfalfa fields in Cache County.
- Arizona. C. D. Lebert (April 21): Noctuid larvae, Leucocnemis sp., severely defoliated ash trees in the Phoenix area. They hide under the bark by day and feed in the new growth by night.
- California. J. Wilcox and M. W. Stone (March 25): Damage by Feltia annexa Treit. was especially severe on lettuce at Costa Mesa. Peas were also attacked.

MOTHS AND BUTTERFLIES (Lepidoptera)

- Vermont. H. L. Bailey (April 20): The first specimen of the painted lady (Vanessa cardui L.) was observed at Springfield, in the southeastern part of the State, today.
- Connecticut. J. V. Scheffner, Jr. (April 21): Cocoons of Philosamia cynthia Drury are abundant in some sections of New Haven. J. E. R. Holbrook and T. P. J. Duffy, of this laboratory, report them very abundant in the vicinity of the New Haven freight yards, where there are many ailanthus trees and saplings of natural reproduction.
- Florida. J. R. Watson (April 23): The orange dog (Papilio cresphontes Cram.) began to be noticed on nursery stock early in April.
- Louisiana. B. A. Osterberger (April 18): On the highway near Gonzales, Ascension Parish, many larval stages, apparently of Estigmene acrea (Drury) were noticed migrating across the paved highway.
- Ohio. E. W. Mendenhall (March 30): The cecropia moth (Platysamia cecropia L.) is quite numerous this year. It made its appearance early, about the middle of March.
- Utah. G. F. Knowlton (April 16): Mourning cloak butterflies (Hamadryas antiopa L.) have been seen on warm days in northern Utah since March 6.

WIREWORMS (Elateridae)

Connecticut. A. W. Morrill, Jr. (April 1): Limonius agonus Say, which usually appears about the end of April, was first observed in small numbers under freshly pulled stumps on March 16 at Windsor, in the west-central part of the State. They were seen in the field when plowing was begun on April 1, and have since been found in large numbers in the soil. These fields will be set to tobacco about June 1, at which time untreated fields may be expected to suffer at least as much damage as was recorded last year. Untreated portions of the fields in question did not produce marketable tobacco last year and the expense was increased by the fact that from five to six resettings by hand were necessary.

Georgia. M. Murphey (April 22): Larvae of Heteroderes laurentii Guer. were collected in strawberry fruit grown at Atlanta. (Determined by A. G. Boving.)

Kansas. H. R. Bryson (April 23): The true wireworms have caused some damage to wheat in a few instances. Aeolus amabilis (Lec.) injured spring wheat in some small plots at Junction City.

Utah. G. F. Knowlton (April 15): Wireworms were numerous in sod examined at Peterson, in Morgan County.

Washington. H. P. Lanchester (April 20): Melanotus oregonensis Lec. has been found in the adult stage during the last month at Walla Walla. The larvae have been noted only recently. L. infuscatus Mots. was collected in both adult and larval stages from a number of cultivated fields, and in at least one instance was the predominant form.

E. W. Jones (April 19): Larvae of the Pacific coast wireworm (L. canus Lec.) and the sugar-beet wireworm (L. californicus Mann.) were found feeding on lettuce plants in gardens at Walla Walla as early as April 7. Large numbers of the sugar-beet wireworm were taken by baiting in the week ended April 18.

WHITE GRUBS (Phyllophaga spp.)

North Carolina. W. A. Thomas (April 15): May beetles are just coming to lights for the first time at Chadbourn, but as yet are not very abundant.

J. F. Cooper (April 20): One-third of a $4\frac{1}{2}$ -acre planting of wheat in Alexander County was destroyed in February and March. No new damage was noted on April 13. Damage appeared only in those parts of the field where wheat had been planted following lospedeza.

Georgia. G. F. Moznette (April 4): P. forsteri Burn. and P. hirticula Knoch have caused considerable injury to the opening buds and new growth on pecan trees in orchards south of Albany. The damage has been especially severe to the buds and new growth on top-worked pecan trees, which were the first to put out in the spring. (Det. by P. Lugnbill.)

Mississippi. C. Lyle (April 21): Slight damage was done by May beetles in one pecan orchard in Jackson County, according to H. Gladney, on April 21, while N. D. Peets reported that he recently observed considerable injury to pecan trees in the southwestern part of the State.

Louisiana. B. A. Osterberger (April 21): June beetles have not been very active since the cold weather the first part of April, which was followed by heavy rains. The last few nights, flights have been very light in East Baton Rouge Parish. The species collected were P. congrua Lec., P. micans Knoch, and a few P. crinita Burm.

Indiana. P. Luginbill (April 25): The first May beetles to appear at La Fayette were a female and a male of P. fervida F., which were captured at traps on the night of April 19.

Kentucky. W. A. Price (April 27): May beetles began flying in Lexington on April 14.

Kansas. H. R. Bryson (April 25): May beetles have been very abundant at lights the last few nights. Larvae of the other broods are causing some injury in gardens and strawberry beds.

GREEN JUNE BEETLE (Cotinis nitida L.)

Georgia. T. L. Bissell (April 15): Larvae have been damaging pimento pepper plant beds at Zebulon, in central Georgia.

Tennessee. L. B. Scott (April 26): The infestation on tobacco plants in Montgomery County is about normal. Severe damage was noted occasionally.

Kentucky. W. A. Price (April 27): Green June beetle larvae damaged tobacco plants in the beds at Lexington, Versailles, and Danville.

JAPANESE BEETLE (Popillia japonica Newm.)

Maryland. H. C. Donohoe (April 22): Numerous samples of soil taken at Princess Anne indicate an average population of more than 11 larvae per square foot. The maximum obtained in any 1-square-foot sample was 29 larvae. Vegetation in the infested area is sparse native cover, the most noticeable plant being wild strawberry, of which the larvae appear particularly fond.

BUMBLE FLOWER BEETLE (Euphoria inda L.)

Vermont. H. L. Bailey (April 22): Several specimens were collected at Dorset, Bennington County, southwestern Vermont, today.

CEREAL AND FORAGE-CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

ARMYWORM (*Cirphis unipuncta* Haw.)

Virginia. H. G. Walker and L. D. Anderson (April 26): Larvae are injuring oats and other crops at Norfolk and it is reported that they are rather abundant on the Eastern Shore of Virginia.

Mississippi. C. Lyle (April 25): A very destructive and widespread outbreak of the true armyworm is occurring in several Delta counties. First complaints were received on April 15. Most of the injury was done to oats, but larvae were also found in alfalfa. Some of the heaviest damage is in Le Flôre and Sunflower Counties, although very serious injury was reported from various localities in Bolivar, Coahoma, Quitman, Tallahatchie, Washington, Sharkey, Humphreys, and Issaquena Counties. Some alfalfa is being destroyed by mixed infestations of armyworm and variegated cutworm. Only a small percentage was parasitized.

Louisiana. R. C. Gaines (April 20): Armyworms were observed and reported in Madison and East Carroll Parishes. This appears to be a rather serious outbreak. The insect was originally reported on April 15 in Tensas Parish and was found in every oat field visited. Stripping was in rapid progress throughout an entire field of 400 or 500 acres. (Det. by C. Heinrich.) (April 19-20): Infestations of true armyworms were observed and reported on oats in Tensas, Madison, and East Carroll Parishes. The damage appears to be most serious in Tensas Parish. Some fields are being stripped now, and others apparently have enough worms to cause complete stripping. Very little stripping has been reported in Madison Parish but there and in East Carroll Parish worms can be found in many fields. The infestations appear to be light. The worms in Madison Parish and in East Carroll Parish, generally speaking, appear to be smaller and less advanced than those in Tensas, where many of the worms in some fields are about ready to pupate. Lycophotia margaritosa saucia Hbâ. was taken in association with the armyworm.

Missouri. L. Haseman (April): During the first week in April armyworm moths were extremely abundant throughout central Missouri, visiting fruit blossoms. Following the severe freeze of April 8 and 9, moth flights continued but moths were less abundant here. Following the freeze in northwestern Missouri moths were reported as being extremely abundant. To date, no evidence of larvae has been reported.

Arkansas. D. Isely (April 19): There was an outbreak on oats in some of the east-central counties where the insect was most destructive last year. All oat fields scouted in Arkansas County were infested.

California. A. E. Michelbacher (April 20): In the Patterson area the armyworm was abundant in alfalfa fields the first part of April.

WHEAT WHITE GRUB (Phyllophaga lanceolata Say)

Kansas. H. R. Bryson (April 23): These grubs caused a tremendous loss to the wheat crop in the southern and central parts of the State.

Oklahoma. F. A. Fenton (April 22): P. lanceolata is causing very little injury at present.

HESSIAN FLY (Phytophaga destructor Say)

Pennsylvania. C. C. Hill and E. J. Udine (April 21): Light infestations prevail in fall wheat throughout most of the State, except in the East where heavily infested fields were found in Bucks County. Examination of puparia from Cumberland County, made today, showed about 6-percent mortality, 14-percent pupation, 12 percent emerged. On this date a few scattered eggs in wheatfields showed the beginning of the oviposition period.

Indiana. C. Benton (April 25): Examination made in a heavily infested field of wheat near Delphi on April 13, showed 88-percent pupation, with 1 percent of the flies emerged. No eggs or larvae were found on that date. On April 23, 90 percent of the puparia were empty, the flies having emerged. An egg count in wheat showed 92 percent of culms infested, with an average of 18 unhatched eggs per culm; a larval count showed 84 percent of culms infested, with an average of 10 small larvae per culm.

Kansas. H. R. Bryson (April 14): Adults were reported flying at Manhattan on April 14. They were observed by R. H. Painter.

J. R. Horton (April 16): The hessian fly has demonstrated very good ability to withstand unseasonably low temperature in the pupal stage. On April 7 to 9 a population, of which 35 to 50 percent were in the pupal stage, was subjected to ground-surface temperatures of 30° F. for 40 hours and 28° for 10 hours more. The extent of mortality resulting has not been determined, but as late as April 16 it shows no striking increase above normal.

CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton (April 25): Migration from winter quarters was slow and gradual during April, many bugs still remaining in clumps of bunch grass. Examination on April 14 of 5 winter wheatfields, totaling 182 acres, and one ryefield of 27 acres showed only 2 bugs, both concealed in pieces of cornstalk. These fields situated near bunch-grass areas are known to be rather heavily infested. Casual observations made in winter wheat since April 12 show light infestation, evidently due to minor flights. April weather has been cool, with frequent rains, but even on several days of bright sunshine, with air temperatures in the 80's, examination in infested clump grasses showed exposed chinch bugs

still with the tendency to hide, characteristic of the bugs earlier in the season. The first noticeable flight of the bugs and the first mating in the field was observed on April 25, with the air temperature at 72°

Illinois. W. P. Flint (April 20): Chinch bugs apparently came through the winter with a very low mortality. There has been some flight during the last few days, but not all of the bugs are out of winter quarters.

Missouri. L. Haseman (April 25): Chinch bugs were observed on the wing on warm days throughout central Missouri during the last 10 days.

GREEN BUG (Toxoptera graminum Rond.)

Oklahoma. C. F. Stiles (April 30): Green bugs are damaging wheat in parts of Harmon and Greer Counties.

Texas. F. L. Thomas (April): Report of damage to wheat by the green bug in Hale County on March 26; also in Floyd County on April 5.

CORN

CORN EAR WORM (Heliothis obsoleta F.)

New Jersey. F. F. Dicke (April): The survival of pupae in cages in the later part of March was somewhat higher than in 1937 (26.5 percent, as compared to 20.5 percent). In a field examination 13.3 percent of the pupae recovered were living. Above-normal precipitation late in the summer and early in the fall resulted in considerable mortality. Winter temperatures at Morristown were about normal. The indications are that early maturing sweet corn in the Burlington section in New Jersey will be somewhat less infested than in 1937.

Virginia. F. F. Dicke (April): The survival of pupae in late March in cages established in mid-September, was slightly higher than in similar cages in 1937 (29.5 percent, as compared to 24.5 percent). In field examinations the survival was found to be somewhat lower than in 1937 (27.3 percent, as compared to 37.0 percent). The heavy rainfall late in the summer and early in the fall of 1937 caused considerable mortality of pupae in the field. The moisture content of the soil was high throughout the fall and winter, a condition unfavorable for successful hibernation. Temperatures were above normal from December to March. With normal temperatures and precipitation in May and June, it is believed that the ear worm will probably be somewhat less abundant in northern Virginia than in 1937.

Georgia. T. L. Bissell (April): Caged female moths are laying eggs in large numbers at Experiment. The first were obtained the night of April 26.

Ohio. F. F. Dicke (April): The pupal survival in cages the last week of March was 10.5 percent, as compared to 9 percent in 1937, when moth emergence in cages was first recorded at Marietta. The temperatures

at Marietta were somewhat lower during the winter of 1937-38 than during that of 1936-37; however, they were above normal. Precipitation was below normal between October and March. With normal temperatures and precipitation in May and June, indications are that the insect will be troublesome in early tomatoes and early maturing sweet corn in the Marietta section.

Georgia. T. L. Bissell (April 18): One male, the first specimen of the season, came to a light trap on April 17 at Experiment, in the central part of the State.

Florida. J. R. Watson (April 23): Complaints are beginning to come in of the depredations of the corn ear worm working as a budworm in all parts of the State.

Kansas. J. R. Horton (April 16): For the first time the corn ear worm succeeded in passing the winter in soil cages operated for 4 successive years. It wintered over in the pupal stage, 6 percent of 200 worms surviving on April 2. The condition of soil and the depth of pupation are about as usual. The winter was mild, except in December when the official temperature dropped 1.0° below normal; in January and February it was 4.5° above normal.

Utah. H. E. Dorst (April 23): Winter survival of pupae from overwintering cages examined on April 21 shows a 17-percent survival, as compared to 65 percent from cages examined the first part of March. No survival was observed in 1937.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

New Jersey. J. B. Schmitt (April 12): Surveys indicate that less than 5 percent of the overwintering larvae were destroyed by winter conditions. Pupation is now in progress. The first pupae were found in South Jersey on April 12.

C. A. Clark (April 23): Spring pupation of the European corn borer is about 2 weeks earlier than usual, owing to very warm weather and sufficient rainfall. Counts indicated from 15- to 25-percent pupation in Burlington and Monmouth Counties by April 22.

Virginia. H. G. Walker and L. D. Anderson (April 26): A large percentage of the overwintering larvae in an out-door cage at the Virginia Truck Experiment Station have pupated and the moths have been emerging for several days.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

Utah. C. J. Sorenson (April 22): Moderately abundant in alfalfa in Cache County.

California. A. E. Michelbacher (April 20): There was only one field in

the San Joaquin Valley injured by the alfalfa weevil and this would not be classed as economic damage. The average number of larvae collected per 100 sweeps of an insect net in this field exceed 3,000. The highest larval populations in other fields were seldom more than 500 and in many fields the count did not exceed 100 per 100 sweeps of a net. The highest average larval count per 100 sweeps was 89 at Pleasanton on April 17, and on the same day in the San Francisco Bay area larval counts in fields not cut were from 49 to 476 per 100 sweeps. Parasitization of large larvae by Bathyplectes in different fields in San Joaquin Valley on April 8 ranged from 14 to 76 percent. At Pleasanton 96 percent of the large larvae were parasitized on April 6. In the San Francisco Bay area parasitization ranged from 87 to 91 percent.

PEA APHID (Illinoia pisi Kltb.)

New Jersey. J. B. Schmitt (March): This aphid was found reproducing on alfalfa the last week in March and is still reproducing.

Delaware. L. A. Stearns (April 23): Because of the unusually early season, pea aphids are appearing in considerable abundance in Sussex County.

Virginia. H. G. Walker and L. D. Anderson (April 26): Many alfalfa fields are rather heavily infested. Although they are not nearly as abundant as last year, these aphids are present in many of the pea fields. Indications are that most of the garden peas in Norfolk and Princess Anne Counties will escape serious injury. However, a few of the pea fields on the Eastern Shore of Virginia are becoming rather heavily infested and at least two of the larger canners have started control operations.

Louisiana. C. O. Eddy (April): These insects appear in small numbers in southern Louisiana but are abundant in the northern part of the State.

Kentucky. W. A. Price (April 27): The aphid is abundant on alfalfa at Princeton and Henderson in western Kentucky.

Wisconsin. J. E. Dudley, Jr. (April 19): The first aphid, an adult stem-mother, was found near Madison on April 4. This aphid must have hatched the first of April or before. Alfalfa was looked over twice weekly since the middle of March but eggs were very scarce last fall.

Kansas. H. R. Bryson (April 25): Some pea aphids are present in the State but are not causing damage.

Utah. G. F. Knowlton (April 3): First-, second-, and third-instar aphids and eggs were found in a gravelly, west-sloping alfalfa field at Mill Creek, in Salt Lake County. (April 21): A mature stem-mother, and first- to fourth- instar nymphs of the second generation, some with well-developed wing pads, were found on alfalfa and sweetclover at Willard, Ogden, and near Provo. (April 25): A few winged and mature second-generation apterous pea aphids are now present on alfalfa. In the Payson-Benjamin area of Utah County these insects are particularly abundant for this early in the season.

C. J. Sorenson (April 22): Pea aphids are very abundant in alfalfa fields at Moab.

Washington. R. D. Eichmann (April 2): Populations nearly stationary during the last month on hay-meadow alfalfa in the southeastern part of the State. Very few are found on erosion-control alfalfa on higher ground.

Oregon. M. M. Reeber and L. P. Rockwood (April 19): The long warm fall of 1937 in the Willamette Valley, following sufficient precipitation to germinate self-sown and early fall-sown annual legumes, and a mild, exceptionally wet winter were favorable to the winter survival of viviparous forms. A wet, cold March delayed the spring build-up of aphids until the first week of April. Since then a rapid increase was noted in several fields of vetch and Austrian winter field peas seeded in September and early in October. Fields seeded after October 25 at a distance from earlier seeded annual legumes or from volunteer are free from infestation, but some migration into these fields is expected soon. The only natural enemies present in appreciable numbers are the two species of fungi Entomophthora aphidis and Empusa planchoniana, especially the former.

California. E. O. Essig (April): The pea aphid has been very abundant in the alfalfa fields of central and southern California since April 1. It is especially numerous in the Antelope Valley near Lancaster.

COWPEA APHID (Aphis medicaginis Koch)

Arizona. C. D. Lebert (April 21): An extremely heavy infestation of the alfalfa or cowpea aphid was observed in a 30-acre field of alfalfa northwest of Phoenix. The alfalfa stems were bent over from the weight of these pests.

CLOVER

CLOVER LEAF WEEVIL (Hypera punctata F.)

Maryland. E. N. Cory (April 19): This pest was reported from Ellicott City attacking clover.

Kentucky. W. A. Price (April 27): This weevil did some damage to clover and alfalfa in the western part of the State.

Kansas. H. R. Bryson (April 13): The clover leaf weevil has been reported as infesting alfalfa fields at Fredonia.

Idaho. R. W. Haegle (April 19): This weevil is much more abundant in the southwestern part of the State than usual and in numerous areas is damaging the early growth of alfalfa. Other outbreaks have been observed in springs following mild winters.

F. H. Shirck (April 15): Larvae are feeding in crowns of alfalfa plants at Parma, in southwestern Idaho, thus preventing new growth.

Damage is accentuated by the recent cool weather, which has held alfalfa from making normal growth.

Utah. G. F. Knowlton (April 16): Adults were observed at Hooper.

C. J. Sorenson (April 22): Larvae were moderately abundant at Hyde Park and Smithfield, Cache County. Two overwintering adults also were seen here.

Washington. E. J. Newcomer (April): A county agent reported that this pest was seriously damaging several alfalfa fields in Yakima County.

CLOVER MITE (Bryobia praetiosa Koch)

Pennsylvania. H. E. Hodgkiss (April 19): This mite is very abundant on clover in the eastern part of the State.

VETCH

VETCH BRUCID (Bruchus brachialis Fahraeus)

North Carolina. J. S. Pinckney (April 19): The vetch weevil is now beginning to emerge from hibernation quarters in central North Carolina. A few adults that emerged were swept from vetch on April 18.

GREEN CLOVER WORM (Plathypena scabra F.)

Georgia. T. L. Bissell (April 14): Beginning March 19, frequent examinations of vetch at Experiment, in central Georgia, have yielded small numbers of eggs, and on that date one small caterpillar was found. On April 14 it matured to a moth. Moths were common at light traps and around buildings from December to March, inclusive.

STRAWBERRY FRUITWORM (Cnephasia longana Haw.)

Oregon. D. C. Mote (April 27): First- and second-instar larvae have been abundant on vetch and clover at Mount Angel, Marion County, in northwestern Oregon, since the first of the month.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

Louisiana. B. A. Osterberger (April 20): In Saint John the Baptist, Ascension, and East Baton Rouge Parishes the early spring weather was very favorable for the early borer emergence, with indications of a very early first generation. The first-generation larval stage was reduced by frost and low temperatures accompanied by wind and rain in April. Eggs are being collected but to date no Trichogramma have been taken.

FRUIT INSECTS

CALIFORNIA TENT CATERPILLAR (Malacosoma californica Pack.)

California. F. H. Wymore (April 18): Heavy infestation noticed of the California tent caterpillar and a few colonies of M. disstria Hbn. on prune and cherry trees in the orchards of the Asti Colony, between Cloverdale and Geyserville. From 12 to 15 colonies of caterpillars were seen on many of the trees. Not a great deal of damage was apparent at that time, but most of the caterpillars were in the second instar, so if nothing is done to prevent feeding, a great deal of damage will result.

LEAF CRUMPLER (Mincola indigenella Zell.)

Texas. F. L. Thomas (April 6): M. indigenella was found at El Campo in Wharton County, on April 6, on plum trees.

TARNISHED PLANT BUG (Lygus pratensis L.)

New York. N. Y. State Coll. Agr. News Letter (April): Tarnished plant bugs numerous in Rockland County on April 18. In Ulster County on April 25, they were numerous on opening buds.

Pennsylvania. H. E. Hodgkiss (April 19): Adults are more abundant on apple, cherry, and peach buds than for several years.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Kentucky. W. A. Price (April 27): San Jose scale is very abundant on peach trees in orchards in western Kentucky.

South Carolina. L. O. Cartwright (April 28): Injury is being complained of by peach growers in the south-central section.

Mississippi. C. Lyle (April 25): L. J. Goodgame, of Aberdeen, and N. D. Peets, of Brookhaven, report heavy infestations on unsprayed fruit trees in their districts.

Arizona. C. D. Lebert (April 21): A heavy infestation was found in a large rose garden in the Phoenix area.

Washington. E. J. Newcomer (April 5): M. A. Yothers examined 2,000 overwintering scales on apple trees and 1,500 on pear trees. At Yakima there were 95 percent and 93 percent alive on the two fruits, respectively. This is the result of a very mild winter, the minimum temperature having been 17° F.

SCURFY SCALE (Chionaspis furfura Fitch)

Connecticut. E. P. Felt (April 23): The scurfy bark louse was extremely abundant on an apple tree at Stamford.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

- New York. D. W. Hamilton (April 26): Approximately 50 percent of the larvae overwintering in paper bands at Poughkeepsie have pupated, whereas only a few of those found while scraping trees at Kinderhook have pupated. Last year, pupae were noted first on May 11, and moths were first captured in bait traps on May 24.
- Delaware. E. A. Stearns (April 23): Between 50 and 75 percent of overwintering larvae pupated on this date. Apples in full bloom.
- Georgia. C. H. Alden (April 20): First moth caught at Cornelia on April 11; eight caught on April 18. No egg deposition to date.
- South Carolina. L. O. Cartwright (April 28): The emergence of spring adults is above average at Clemson. The peak of adult emergence was April 14.
- Indiana. L. F. Steiner (April 25): Moth emergence began in the insectary at Vincennes on April 24, and the first moths were taken from bait traps on April 25. Development is 2 weeks earlier than normal. Hatching is expected to start about May 5. Pupation under rough bark had reached only 33 percent by April 23.
- Illinois. W. P. Flint (April 20): Survival very high. Pupation is general in the southern part of the State. No adults have been observed to date.
- Michigan. R. Hutson (April 25): Larvae came through the winter in good condition, and are abundant in fruit-growing districts.
- Kentucky. W. A. Price (April 27): Moth emergence began at Paducah on April 15, and by April 19 about 73 percent of the larvae had pupated. At Lexington, flight began on April 25.
- Missouri. L. Haseman (April 22): Pupation has been under way since the middle of the month, with 15 percent of the larvae in the pupal stage in our breeding sticks in southwestern Missouri. At Columbia some of the breeding-cage material is showing nearly 30 percent pupation, but examination at Columbia on April 22 showed the overwintering worms on the tree trunks still in the larval stage.
- H. Baker (April 20): The first pupae were observed in the field on April 5; at present about one-third of the hibernating larvae have pupated.
- Kansas. H. R. Bryson (April 23): Codling moth is reported to be more abundant in northeastern Kansas than for several years.
- Washington. M. A. Yothers (April 5): Winter mortality at Yakima has been negligible owing to mild temperatures.

EASTERN TENT CATERPILLAR (Malacosoma americana F.)

New Hampshire. J. G. Conklin (April 13): Tent caterpillars began hatching in Durham on April 13. They appear to be fully as abundant throughout the southern half of the State as they were last year.

Vermont. H. L. Bailey (April 20): Eggs have hatched and tents are forming in large numbers throughout the southern half of the State.

Massachusetts and Connecticut. J. V. Schaffner, Jr. (April 15): Hatching in Massachusetts was noted as general in the northwestern part of Middlesex County on April 14, while in the southern part of Worcester County and in several localities in Connecticut, the newly formed tents were from 2 to 3 inches in diameter on that date.

Connecticut. M. P. Zappe (April 23): Webs are present but much less abundant than last year.

New York. N. Y. State Coll. Agr. News Letter (April): Apple-tree tent caterpillars were observed hatching on wild cherry on April 1 at Ithaca.

R. E. Horsey (April 17): Caterpillars $1\frac{1}{8}$ inch long were found on April 16. They were in nests from $1\frac{1}{2}$ to 2 inches in diameter on ornamental and native wild crab apples. They were very numerous in native woods on wild black cherry (Prunus serotina) and common choke-cherry (P. virginiana) near Irondequoit Bay, east of Rochester on April 17. About every wild cherry tree or shrub had from 4 to 20 nests. Other reports indicate a heavy infestation in the Rochester district.

New Jersey. G. J. Macussler (March 29): Egg masses were observed hatching at Moorestown on March 29.

E. Kostal (April 22): Very few nests have been noted in the vicinity of Morganville, Monmouth County.

Delaware. L. A. Stearns (April 20): The infestation is general and more severe in southern Delaware than usual.

Maryland. E. H. Siegler (April 22): The eastern tent caterpillar is not abundant at Beltsville and vicinity.

H. C. Donohoe (April 22): Tent caterpillar nests are abundant in uncultivated shrub and forest land in the vicinities of Salisbury and Princess Anne.

Virginia. H. G. Walker and L. D. Anderson (April 26): Tent caterpillars have been rather abundant in the Norfolk area during April. They have been especially abundant on wild cherry and have defoliated many of these trees, notably in the Ocean View section of Norfolk.

North Carolina. J. F. Cooper (April 20): The tent caterpillar was noted as quite abundant on April 13 in Alexander and Iredell Counties. Colonies were noted on native trees, apple, and peach.

W. A. Thomas (April 20): This insect has completed its larval development and has already pupated at Chadbourn. The tents were more numerous this season than last.

South Carolina. W. C. Nettles and F. Sherman (April 28): Apple-tree tent caterpillar is more noticeable than usual.

Tennessee. L. B. Scott (April 1): Small webs were very abundant in Montgomery County on March 27.

Mississippi. C. Lyle (April 23): J. P. Kislanko reported on April 1 that almost every wild cherry and plum tree in the Wiggins district had a web of M. americana. A heavy infestation was reported in an orchard and nursery at Lumberton, Lamar County.

Pennsylvania. H. E. Hodgkiss (April 19): Tent caterpillars have been hatching and webs are already formed.

Ohio. T. H. Parks (April 22): Tent caterpillars are now becoming common on wild cherry and other trees in eastern Ohio counties. Hatching began at Cleveland on March 28. The infestation in eastern Ohio has been increasing during the last 3 years.

EYE-SPOTTED BUDMOTH (Spilonota ocellana D. & S.)

New York. N. Y. State Coll. Agr. News Letter (April): The budmoth was entering the buds rapidly in the lake fruit district the latter half of the month. It was also active in the lower Hudson River Valley.

FRUIT TREE LEAF ROLLER (Cacoccia argyrospila Walk.)

New York. N. Y. State Coll. Agr. News Letter (April): A few fruit tree leaf rollers were observed in the Hudson River Valley, also in Orleans and Monroe Counties about April 20.

Pennsylvania. H. E. Hodgkiss (April 19): Caterpillars are hatching and entering partly opened bud clusters.

RED-BANDED LEAF ROLLER (Argyrotaenia volutinana Walk.)

New York. N. Y. State Agr. Expt. Sta. Staff (April 22): The adults are active in the apple orchards at Ithaca. This insect is present in large numbers in some sections.

FRUIT APHIDS (Aphidae)

New Hampshire. J. G. Conklin (April 12): Apple aphids began hatching in Durham on April 12 on trees that had been under observation daily.

Connecticut. M. P. Zappe (April 23): Green aphids (Aphis pomi Deg.) and rosy aphids (Anuraphis rosaeus Bak.) hatched rather abundantly in many orchards in New Haven and Fairfield Counties. Very scarce in these orchards at present. Have had temperatures as low as 18° F. since the aphids hatched.

New York. N. Y. State Agr. Expt. Sta. Staff (April 22): The three apple aphids, A. pomi, A. roseus, and Rhopalosiphum prunifoliae Fitch, have been hatching at Ithaca during the warmer periods since the first of April. They are not very abundant.

N. Y. State Coll. Agr. News Letter (April): The green and grain aphids were observed hatching the last week in March and the first week in April in the lower Hudson River Valley and also along the lake. A few specimens of these species, together with the rosy aphid, were observed at Ithaca on March 31. The rosy aphid, although later, was being observed generally by the middle of the month.

Pennsylvania. H. E. Hodekiss (April 19): Late-hatching aphids, mostly the rosy apple aphid, were killed in considerable numbers by freezing temperatures. The earlier individuals were plentiful enough to cause considerable damage to apples.

Indiana. L. F. Steiner (April 25): The rosy aphid is as abundant in southwestern Indiana as ever before observed, according to numerous growers. Serious injury is anticipated.

Kentucky. W. A. Price (April 27): Rosy aphid is very abundant on apple trees at Lexington, Paducah, Henderson, and Princeton.

Michigan. R. Hutson (April 25): Aphids are fairly common on apple trees throughout the fruit-growing district. In most places it is the bud aphid (R. prunifoliae). Only one infestation of rosy apple aphid has been reported, and that from Three Rivers.

Missouri. L. Haseman (April 25): At Columbia little or no evidence has been seen as yet of the rosy aphid. Some growers in east-central and southwestern Missouri are reporting aphids.

Washington. E. J. Newcomer (April): The green apple aphid seems to be more numerous than usual in Yakima County.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Nebraska. M. H. Swenk (April 18): Reports of damage to fruit and shade trees have been received from Lancaster, Butler, York, Merrick, Hall and Buffalo Counties.

Oklahoma. F. A. Fenton (April 22): Reports of damage have been received from Stewart and Oklahoma City.

THRIPS (Thysanoptera)

Pennsylvania. H. E. Hodgkiss (April 19): Thrips adults are very abundant on apple buds in some orchards.

PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Delaware. L. A. Stearns (April 23): Between 80 and 90 percent of the overwintering larvae have pupated on this date. Peaches are approaching the shuck stage.

South Carolina. O. L. Cartwright (April 28): Infestation is moderate to heavy in peach orchards in the south-central section. The pest is earlier than usual in its activities.

Georgia. C. H. Alden (April 18): Fruit moth caught on April 18 at Cornelia. No egg laying or twig injury has been noted to date in this section.

O. I. Snapp (April 22): A practically matured larva was found in a peach drop on April 9 at Fort Valley. The first peach twig injury was noticed on April 13. The larvae in these twigs were from one-fourth to one-third grown. The infestation is light.

Michigan. R. Hutson (April 25): The oriental fruit moth had approximately pupated 50 percent on March 25 at St. Joseph, and on April 11 from 30 to 50 percent at South Haven.

PEACH BORER (Conopia exitiosa Say)

Illinois. O. I. Snapp (April 13): During the examination of peach trees at Carbondale, southern Illinois, 53 peach borers were removed from one large 10-year-old peach tree. This is believed to be a record for the number of borers in one tree.

PLUM CURCULIO (Conotrachelus nenuphar HBst.)

Delaware. L. A. Stearns (April 20): The first curculio of the season was collected by jarring in Sussex County on April 6, about 2 weeks earlier than usual. They are appearing in about normal numbers.

Virginia. A. M. Woodside (April 20): Plum curculio beetles are present in very large numbers in the Crozet peach orchards. More than 330 beetles were jarred from 20 trees in the Zirkle orchard on April 13. This is the heaviest concentration I have observed.

Georgia. C. H. Alden (April 20): Peak emergence from hibernating quarters occurred on March 24 at Cornelia, when 130 were caught by jarring 20 large peach trees.

O. I. Snapp (April 22): One nearly full-grown larva was observed in a green peach at Fort Valley, central Georgia, on April 8. Full-grown larvae were recovered from peach drops in trays on April 13, which is 3 weeks earlier than last year, and the peak of larval emergence from peach drops occurred on April 19. Conditions in peach orchards were favorable for the matured larvae to enter the soil. Heavy rains beat peach drops into the soil and made the soil wet for a considerable depth. This facilitated the entrance of larvae into the soil and the construction of their soil cells. The infestation is now considered lighter than that of an average year, which is largely attributed to the light infestation last year and the lighter than usual carry-over of adult beetles. It is probable that at least the Elberta peaches in Georgia will be subjected to a second brood of the curculio this year. The peak of the Hiley drop occurred on April 15, and the peak of the Elberta drop on April 20. The drop was unusually heavy this year, but the curculio infestation in the drop was light.

Mississippi. H. C. Peets (April 25): Damage in some peach orchards in Lincoln County recently reported.

Tennessee. L. B. Scott (April 26): The infestation appears to be about normal in north-central Tennessee. Damaged peaches are very common.

Kentucky. W. A. Price (April 27): On April 17 egg deposition on cherries was reported from Cadiz, and specimens were jarred from plum trees at Henderson on April 18. Egg punctures were observed at Lexington on April 25.

BLACK PEACH APHID (Anuraphis persicae-niger Smith)

Virginia. W. J. Schoene (April 20): The black peach aphid has been reported over a wide area.

South Carolina. W. C. Nettles and F. Sherman (April 28): Black peach aphid has been much complained of in commercial peach orchards in the western part of the State.

LEAFHOPPERS (Cicadellidae)

Virginia. A. M. Woodside (April 20): Leafhoppers are very numerous on peach trees at Crozet and Timberville. The most common species is Erythroneura obliqua (Say), but there are a few specimens of E. hartii (Gill) and E. lawsoniana Bak., E. lawsoniana is fairly common on apple, together with a few individuals of the other two species.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

New Hampshire. J. G. Conklin (April 21): On April 20 a few adults were seen in one of the University orchards at Durham. On this date the temperature rose to 85° by 2 p.m. The next day very heavy egg deposition was noted in the orchard.

New York. N. Y. State Coll. Agr. News Letter (April): The first nymphs were observed on April 19 and 20, in the lower Hudson River Valley. In western New York eggs are quite numerous but no hatching has been reported.

PEAR THRIPS (Taeniothrips inconsequens Uzel)

Oregon. D. C. Mote (April): Adults began emerging in small numbers the week of March 7 in the vicinity of Corvallis and Salem.

RASPBERRY

RASPBERRY FRUITWORM (Byturus unicolor Say)

New York. N. Y. State Coll. Agr. News Letter (April): The American raspberry beetle was observed in Orange and Ulster Counties on April 20.

RASPBERRY ROOT BORER (Bombocia marginata Harr.)

Washington. W. W. Baker (April 19): B. marginata began to break hibernation in the Puyallup Valley between April 7 and 11. A small percentage of the larvae were still in the hibernacula on April 19.

ROSE SCALE (Aulacaspis rosae Bouche)

Ohio. E. W. Mendenhall (April): The rose scale is quite bad on some of the raspberry plantations in Knox County.

SNOWY TREE CRICKET (Oecanthus niveus Deg.)

Ohio. E. W. Mendenhall (April): The snowy tree cricket is abundant on raspberry plantations, especially in grass and weeds along fence rows.

BLACKBERRY

SOFT SCALE (Coccus hesperidum L.)

Arizona. C. D. Lebert (April 21): A rather heavy infestation of soft-brown scale was found on Boysenberry and blackberry plants in the Phoenix-Mesa area.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

Utah. G. F. Knowlton (April 12): Grape leafhoppers, E. comes ziczac Walsh, were active during the warm part of the day, near piles of Virginia creeper leaves at Logan. Overwinter survival seems to have been rather large.

PECAN

PECAN LEAF CASEBEARER (Acrobasis juglandis LoB.)

Georgia. G. F. Moznette (April 1-17): This insect has caused severe damage to the new growth on pecan trees south of Albany in orchards where control measures were not carried out last season. In some orchards the damage to the new growth is so severe that production of nuts will be curtailed.

Mississippi. C. Lyle (April 21): Two rather heavy infestations on pecan trees were reported from Harrison County on April 21. Specimens were received from De Soto County on April 20, with light injury reported.

HICKORY SHUCK WORM (Laspeyresia caryana Fitch)

Georgia. G. F. Moznette (April 1-17): Moths of the spring brood continued to emerge during April from pupae in the 1937 shucks, the peak of the emergence taking place the latter part of March. On April 16 the last moth was recorded as emerging from pupae in the 1936 shucks. Some larvae pass through two winters before transforming. Eggs were first found on Phylloxera galls on seedling pecan trees on April 10 and larvae were found within the galls on April 16. Up to April 17 no eggs were found on the foliage or pistillate flowers on budded pecan trees in orchards in the vicinity of Albany.

A SAWFLY (Periclista sp.)

Alabama. J. M. Robinson (April 16): Sawflies were attacking pecan trees at Samson, Geneva County, in southeastern Alabama on April 16. This is probably P. hicoloriae Rohw., judging by the files of the Insect Pest Survey.

CITRUS

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Alabama. J. M. Robinson (March 8): The citrus whitefly was reported as attacking gardenia foliage and stems at Martsboro on March 8.

Mississippi. C. Lyle (April 25): N. L. Douglass, of Grenada, and W. D. Pects, of Brookhaven, have recently reported heavy infestations on Cape-jasmine in their districts.

Texas. F. L. Thomas (April 20): Whiteflies, presumably D. citri, were reported by J. N. Roney as abundant on satsuma at Port Arthur, in Jefferson County, and at Angleton, in Brazoria County. They have also been attacking privet and Cape-jasmine in Brazoria and Galveston Counties, respectively.

CITRUS MEALYBUG (Pseudococcus citri Risso)

Florida. J. R. Watson (April 23): Some complaints of the citrus mealybug are beginning to come in.

A CITRUS ROOT WEEVIL (Pachnaeus sp.)

Florida. J. R. Watson (April 23): A complaint has been received of the work of the citrus root weevil in Dade County.

CITRUS RUST MITE (Eriophyes oleivorus Ashm.)

Florida. J. R. Watson (April 23): Rust mites are very abundant and destructive, as the weather has been very warm and dry for the last month.

SIX-SPOTTED MITE (Tetranychus sexmaculatus Riley)

Florida. J. R. Watson (April 23): The six-spotted mite was very common and injurious to citrus trees in the latter part of March and the first half of April, but the infestation is rapidly subsiding. A species of Scymnus was found feeding on it.

FIG

MEDITERRANEAN FIG SCALE (Lepidosaphes ficus Sign.)

California. C. K. Fisher (April 18): The first hatch of eggs was observed today. Last year the first hatch began about April 23. There has been a steady increase and a steady spread of this insect to new localities ever since it was first noticed in this community.

BLASTOPHAGA (Blastophaga psenes L.)

California. Perez Simmons (April 10): A few females had emerged from galls in mammea caprifigs examined today at Fresno, but none were seen flying.

TRUCK - CROP INSECTS

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Alabama. J. M. Robinson (April 23): The vegetable weevil has been very abundant in the southern part of the State, the heavily infested area extending three-fourths of the way north on the west side, from November to the present time, the larvae causing considerable damage. The places reporting the greatest destruction were Ozark, Flomaton, Dadeville, and Fayette. Larvae were particularly abundant in some gardens around Auburn during the winter.

Mississippi. C. Lyle (April 25): Vegetable weevils have been unusually abundant in the southern half of Mississippi during April and a few complaints have been received from the central and northern sections of the State. N. D. Poets, at Brookhaven, has reported that this species is causing more injury to vegetables in southwestern Mississippi than in previous years. Severe injury to turnips in his district is reported by J. Milton, of Jackson. H. Gladney reported one field of turnips in Harrison County practically ruined, and moderate damage to turnips was observed by D. W. Grimes, of Durant.

Louisiana. P. K. Harrison (April 16): Larvae are still doing some injury to mustard at Baton Rouge.

Texas. F. L. Thomas (March 10): The vegetable weevil was reported today from Jacksonville, in Cherokee County, attacking spinach, cabbage and radishes. This is the first record of occurrence in that section. This is an area where tomatoes are grown extensively on a commercial scale.

California. J. Wilcox and M. W. Stone (March 25): Severe damage by the larvae was done to carrots and cabbage in a small garden earlier this month. On this date only one larva was found, but adults were numerous. April 19: Severe damage by larvae to potatoes at Costa Mesa.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Virginia. H. G. Walker and L. D. Anderson (April 26): The twelve-spotted cucumber beetle, which is relatively scarce, has been observed feeding on alfalfa and spinach on warm days all winter long at Norfolk. They have also been observed in bean and potato fields, where they have not been abundant enough to cause appreciable damage.

South Carolina. W. C. Nettles (April 28): The spotted cucumber beetle has done noticeable damage to the foliage of young peach trees in Edgefield County.

Mississippi. C. Lyle (April): Adults and larvae sent in from Forrest County, with the statement of heavy injury to watermelon plants. Injury to corn by larvae was reported from Saucier, Harrison County,

on April 1; larvae were sent from Utica, Hinds County, on April 5, collected from tomato plants, severe injury being caused to tomatoes following vetch; and J. Milton observed that the beetles were abundant on turnips in Simpson County on April 19.

Louisiana. C. E. Smith (April 20): Young adults became abundant on various crops and flowering plants in the vicinity of Baton Rouge from April 15 to 17, the first one having been observed on April 1. No fresh larval damage noted since about April 10.

Texas. F. L. Thomas (April 20): Has been more injurious than usual in the destruction of early corn planted on March 29, especially in river-bottom areas.

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

South Carolina. C. O. Bare (April 19): Striped cucumber beetle was present near Charleston, feeding, mating, and congregating in numbers, there being approximately from 8 to 15 beneath each hill of squash, cucumbers, and Cucurbita pepo. Many of the plants were killed and others seriously damaged.

WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

Oregon. D. C. Mote (April): On February 10 adults were noted feeding at Corvallis.

FLEA BEETLES (Halticinae)

Mississippi. C. Lytle (April 12): Flea beetles, Altica sp., were reported doing severe damage to strawberry plants at McAdams, in Attala County, on April 12, the infestation being spotted over the field. Moderate-to-heavy infestations of flea beetles were found on turnips in the vicinity of Durant, but no specimens were sent with the report.

Colorado. G. M. List (April): The flea beetle (Systema taeniata Say) has appeared in Fort Collins gardens during the last few days.

IMBRICATED SNOUT BEETLE (Epicaerus imbricatus Say)

Mississippi. C. Lytle (April 5): Adults were reported as very abundant on turnips and beans at Lucedale, in George County. Adults were received from a correspondent on April 5 from Brooklyn, Forrest County, with the statement that they were numerous on garden plants.

GREENHOUSE WHITEFLY (Trialeurodes vaporariorum Westw.)

Virginia. H. G. Walker and L. D. Anderson (April 26): Whiteflies have been rather abundant on tomatoes in a greenhouse near Norfolk. A small hymenopterous wasp, Encarsia formosa Gahan, as determined by

A. B. Gahan, has parasitized 95 percent of the nymphs and has just about cleaned up this infestation.

MOLE CRICKETS (Gryllidae)

Mississippi. C. Lyle (April 25): Correspondents at Madison and Crystal Springs have recently written that strawberries were severely injured by crickets. No specimens were sent. A correspondent at Gautier, Jackson County, sent specimens of S. acletus on April 18, with the report that tunnels were very noticeable.

Texas. J. N. Ronoy (March): Winged forms of Gryllotalpa hexadactyla Perty and Scapteriscus acletus R. & H. were found in March on tomatoes, eggplant, strawberries, cabbage, turnips, and rutabagas in Galveston County.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Virginia. H. G. Walker and L. D. Anderson (April 26): Colorado potato beetles are very abundant in the Norfolk area and on the Eastern Shore of Virginia. The eggs are very abundant but no larvae have been observed.

North Carolina. W. A. Thomas (April 20): Adults have been very abundant on potatoes around Chadbourn since the last week in March. Heavy oviposition began the second week in April and the larvae are becoming numerous.

Mississippi. C. Lyle (April 22): This insect was reported by L. J. Goodgame in Monroe and Chickasaw Counties on April 22, as plentiful in tomato plant beds; in Harrison County on April 21 by H. Gladney as heavily abundant, two infestations being on tomatoes; in southwestern Mississippi by N. D. Peets as abundant on Irish potatoes; in Jackson by J. Milton as causing light-to-medium damage to Irish potatoes; and in the Durant district by D. W. Grimes as having been observed at different points but doing little damage.

Louisiana. B. A. Osterberger (April 18): The Colorado potato beetle has been seriously injuring Irish potatoes and, in a few instances, tomatoes, in East Baton Rouge Parish.

Washington. E. W. Jones (April 19): Adults were abundant in the soil of last year's potato fields as determined by soil siftings at Walla Walla in March and April.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Virginia. H. G. Walker and L. D. Anderson (April): Potato flea beetles are emerging from hibernation and have been feeding on potatoes at Onley.

WESTERN POTATO FLEA BEETLE (Epitrix subcrinata Lec.)

Oregon. D. C. Mote (April 16): These flea beetles were observed in Columbia County on April 16.

POTATO LEAF HOPPER (Empoasca fabae Harr.)

Virginia. F. W. Poos (April 25): This species has been taken at a trap light on the nights of April 19 and 20, which is 16 days earlier than any previous record obtained at Arlington during the last several years. The development of the foliage of certain tree hosts of this species compared favorably with what it usually is early in May, when **the insect normally** appears.

POTATO PSYLLID (Paratrioza cockerelli Sulc.)

Oklahoma. E. Hixson (April 15): I am sending specimens which were collected from tomatoes growing in the greenhouse at Stillwater. (Det. by P. W. Oman.)

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Virginia. L. W. Brannon (April 15): The first adult of the season was found feeding on snap beans in a field near Norfolk on April 11. Only 1 beetle was found on 40 rows 200 feet long, so the beetle was, no doubt, one of the first to emerge. The first field emergence was 9 days earlier than ever recorded at this location. The season in general appears to be about 2 weeks earlier than normal.

Georgia. T. L. Bissell (April 28): At Experiment the first beetles of the season were seen today but obviously had fed for 2 or 3 days. One mass of eggs was found. The first beetles seen in former years appeared on May 1, 1929; May 11, 1934; April 22, 1935; May 5, 1936; and May 4, 1937.

Colorado. R. L. Wallis (April 20): Examination of hibernating beetles at Grand Junction on April 18 showed 39 percent **winter mortality**. **Normal winter mortality is approximately from 60 to 70 percent in this locality at this season of the year.**

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Virginia. L. W. Brannon (April 18): The first bean leaf beetles of the season were observed feeding in the field at Norfolk on young snap beans on April 15. This is 3 weeks earlier than this insect was first observed in the field in 1937.

H. G. Walker and E. D. Anderson (April 26): Bean leaf beetles are present but have not done much feeding in any of the early bean fields examined in Norfolk or Princess Anne Counties or on the

Eastern Shore of Virginia.

South Carolina. W. C. Nettles (April 28): The spring injury appears to be less than the average for recent years.

Georgia. T. L. Bissell (April 28): At Experiment beetles were severely puncturing bean leaves, as usual in the spring.

LEGUME POD MOTH (Etiella zinckenella Treit.)

California. R. Cecil (April 20): Adults from overwintered larvae began emerging on February 24 at Ventura. First-brood larvae were collected on April 19 in pods of the wild host plant, Lupinus succulentus. The first brood occurs on wild host plants, of which L. succulentus is the most important.

CABBAGE

IMPORTED CABBAGE WORM (Pieris rapae L.)

New York. N. Y. State Coll. Agr. News Letter (April 25): Cabbage butterflies were first observed in Rockland County by W. J. Clark this week.

Mississippi. N. D. Peets (April 25): Considerable injury to cabbage in the trucking section of Copiah County has been observed.

Louisiana. P. K. Harrison (April 16): Severe injury has been done to mustard in experimental plots at Baton Rouge.

Utah. G. F. Knowlton (April 15): An adult was observed in flight at Trenton, in Cache County today.

CABBAGE LOOPER (Autographa brassicae Riley)

Louisiana. P. K. Harrison (April 16): Slight injury has been caused in experimental plots of mustard at Baton Rouge.

Texas. J. N. Roney (March): Reported throughout March on cabbage, sweet peas, and Irish potatoes.

CABBAGE MAGGOT (Hylemyia brassicae Bouche)

New York. N. Y. State Coll. Agr. News Letter (April 25): Cabbage maggot eggs were first observed this week in Nassau County and flies were beginning to emerge in Rockland County.

HARLEQUIN BUG (Murgantia histrionica Hahn)

North Carolina. W. A. Thomas (April 14): This insect continues to come into fields of crucifers near Chadbourn in great numbers. Some of

the plants have been killed, while others are badly discolored and the foliage wilted.

Georgia. C. H. Alden (April 20): A large number of adults have been found in gardens at Cornelia. They are more numerous than last year.

Tennessee. L. B. Scott (April 26): Many adults were noted on April 20, feeding on mustard in Montgomery County.

Mississippi. C. Lyle (April): At Magee, Simpson County, J. Milton reported noticeable damage to turnips on April 19; in Grenada a heavy infestation in a garden was observed by N. L. Douglass; and at Lexington damage was done to turnips.

Louisiana. C. O. Eddy (April): The harlequin cabbage bug has been active.

CABBAGE APHID (*Brevicoryne brassicae* L.)

Virginia. H. G. Walker and L. D. Anderson (April 26): Cabbage aphids have been very abundant in some fields of cabbage, seed kale, and seed collards in the Norfolk area.

Mississippi. N. D. Poets (April 21): Heavy infestations of aphids on cabbage were found recently at Brookhaven.

Tennessee. L. B. Scott (April 18): Practically all cabbage in Montgomery County is at least moderately infested with cabbage aphids.

ASPARAGUS

ASPARAGUS BEETLE (*Crioceris asparagi* L.)

Virginia. H. G. Walker and L. D. Anderson (April 26): Adults and eggs are rather abundant in a field of asparagus in Northampton County.

South Carolina. W. C. Nettles (April 23): The asparagus beetle is more noticeable than usual.

Utah. G. F. Knowlton (April 27): Adults were brought from Roy, Weber County, in northern Utah, by a farmer who reported that he noticed the insect in 1937 for the first time. This is my first knowledge of its occurrence in the State.

Washington. E. W. Jones and M. C. Lane (April 19): The asparagus beetle was found in asparagus fields around Walla Walla on April 13 and is now common.

California. R. E. Campbell (April 13): Asparagus beetles are causing considerable damage in Los Angeles County by feeding and laying eggs on asparagus shoots.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Virginia. H. G. Walker and L. D. Anderson (April 26): Onion thrips are very scarce on onions in the field, but they are rather abundant in a greenhouse near Norfolk.

North Carolina. W. A. Thomas (April 21): This insect has just recently become very abundant on a small area of white Bermuda onions. The foliage is showing signs of serious injury. This is an annual pest in the Chadbourn area, which makes it almost impossible to produce a marketable crop.

SPINACH

APHIDS (Aphididae)

Virginia. H. G. Walker and L. D. Anderson (April 26): The spinach aphid (Myzus persicae Sulz.) continued to be rather abundant in some fields of spinach around Norfolk during the early part of April, and a few fields were rather heavily infested until they were harvested about April 21. However, most of the later spinach, harvested after April 10, was relatively free from aphids.

H. G. Walker and L. D. Anderson (April 26): A few pink and green potato aphids (Illinoia solanifolii Ashm.) began appearing in a spinach field near Portsmouth about April 15 and continued to increase in numbers until the crop was harvested on April 21 and 22.

SPINACH LEAF MINER (Pegomya hyoscyani Panz.)

California. R. E. Campbell (April 15): A leaf miner (probably the spinach leaf miner) is seriously damaging Swiss chard and beginning on spinach at the Los Angeles County Farm near Downey.

LETTUCE

APHIDS (Aphididae)

Arizona. C. D. Lebert (April 21): Aphids (several species) are abundant on lettuce all over Salt River Valley and nearly all the lettuce growers are dusting.

STRAWBERRY

STRAWBERRY WEEVIL (Anthonomus signatus Say)

Delaware. L. A. Stearns (April 20): Very abundant and general injury is reported to strawberry plantings in southern Delaware.

Virginia. L. D. Anderson and H. G. Walker (April 26): The strawberry weevil does not appear to be as abundant as usual in some of the strawberry fields in Accomac County. However, one field examined on April 15 had about 25 percent of the buds cut and the weevils were quite active.

North Carolina. W. A. Thomas (April 21): The peak of injury to strawberries around Chadbourn was passed during the first week of April, when blackberry buds became available for food and oviposition. No emergence of the new generation developing in the fields has been observed.

STRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

New Jersey. H. W. Allen (April 20): Adults are beginning to emerge around Moorestown.

SPITTLE BUGS (Cercopidae)

Louisiana. C. O. Eddy (April): The spittle bug, or froghopper, has damaged strawberry plants in the eastern parishes.

Oregon. D. C. Mote (April): No nymphs of Philacnus leucophthalmus L. had hatched on March 21 but were observed hatching on March 29 at Corvallis. They were observed as first-, second-, and third-instar nymphs damaging strawberry.

COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker and L. D. Anderson (April 26): Red spiders are reported as being rather abundant in a few strawberry fields on the Eastern Shore of Virginia and in Norfolk and Princess Anne Counties, where they have caused considerable injury.

North Carolina. W. A. Thomas (April 15): The red spider has been a major pest of strawberries in the Chadbourn area this season. The injury first became noticeable in March, following the unusual dry weather of February and early March. The attack has increased in intensity, despite the heavy rains late in March and early in April. The injury is general over most of the fields and many plants have lost most of their foliage and are unable to mature the small unmarketable fruit. Unless conditions improve it will not be possible to carry some of the fields of bearing plants through the summer.

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas formicarius F.)

Louisiana. C. O. Eddy (April): The sweetpotato weevil is laying eggs on early plants in the field.

SUGAR BEETS

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Utah. H. E. Dorst (April 23): Population of the beet leafhopper in most desert breeding areas of northern Utah is approximately one-fifth higher than last year. Winter survival has been high, but the fall population of 1937 was reduced because of poor host plant condition. Some survival has been observed in the agricultural area. First-instar nymphs were first observed on April 22, as compared to May 4 in 1937 and April 20 in 1936.

TOBACCO

TOBACCO FLEA BEETLE (Epitrix parvula F.)

South Carolina. W. C. Nettles and F. Sherman (April 28): The tobacco flea beetle has been doing noticeable damage to newly set plants in the field.

Tennessee. L. B. Scott (April 26): The tobacco flea beetle continues to damage plants in tobacco plant beds in Montgomery County, many beds having been damaged seriously. The infestation is much more severe than in 1937.

TOMATO WORM (Protoparce sexta Johan.)

Florida. A. H. Madden (April 5): An adult female was taken in a moth trap near Quincy on March 29. This is the earliest record of the seasonal occurrence of hornworm ever obtained at the Quincy field station; however, no additional specimens have been obtained. (April 16): A few eggs were taken on tobacco growing in the field on April 14 and were brought into the insectary, where they hatched the following day, indicating that they had been deposited several days prior to the time they were discovered. This is the earliest known seasonal record of egg deposition ever obtained here.

TOBACCO BUDWORM (Heliothis virescens F.)

Florida. F. S. Chamberlin (April 1): Larvae are very abundant on newly set plants in Gadsden County.

GARDEN FLEA HOPPER (Halticus citri Ashm.)

Florida. F. S. Chamberlin (April 18): The garden flea hopper is more abundant than usual in fields of young tobacco in Gadsden County.

MOLE CRICKETS (Gryllidae)

Connecticut. A. W. Morrill, Jr. (April 22): On April 22 characteristic "runs" were noted in a plant bed established this year on new land that had been sterilized. No specimens have as yet been

captured. The description of the insect by the growers, together with the numerous runs, seems to indicate that the infestation is of mole crickets, which have not hitherto been found in seedbeds here. Last year the first commercial attack was recorded by A. I. Bourne in Massachusetts on potatoes. (See I. P. S. Bull. Vol. 17, p. 450. November 1, 1937.)

Kentucky. W. A. Price (April 27): A species of pigmy mole cricket was received from Wootton with the statement that it was abundant in tobacco beds.

A CRANE FLY (Tipulidae)

Kentucky. W. A. Price (April 27): Crane fly larvae are very abundant. Many of them are found in tobacco beds, where they are reported to have caused some damage.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy (April 18): The first two weevils of the season were observed in Florence County in a field near a barn where cotton seed had been stored. (April 23): Not as much weevil activity as expected in hibernation cages. First half of month was cold and cotton is a week or 10 days late. (April 30): First weevils caught on flight screen on April 25 and collected on cotton on the 26th.

Georgia. P. M. Gilmer (April 2): Considerable movement of hibernated weevils to fields reported by farmers. (April 23): Insect activity has been rather light because of the unfavorable weather conditions. A rather high survival of weevils is indicated by activity in hibernation cages. (April 30): Weevils are becoming abundant and in some fields over 600 per acre have been found.

Florida. C. S. Rude (April 30): Only a few weevils have been found on cotton in the vicinity of Gainesville, and a few have been reported from Madison County.

Mississippi. E. W. Dunnam (April 23): At Stoneville no weevils have been observed this year. None was reported on this date in 1936 or 1937, but one was seen on April 19, 1935.

Louisiana. R. C. Gaines (April 30): No field examinations have been made at Tallulah but more weevils are being caught on flight screens than in April 1936 or 1937, and a high survival is indicated.

Texas. F. L. Thomas (April 22): The usual extensive survival in the lower Rio Grande Valley did not occur this spring, because of the

fall clean-up of cotton fields. Severe early damage is therefore not anticipated, despite the fact that the winter has been mild and some weevils have already been found on cotton in the field. Survival to date in central Texas is 0.7 percent, about normal for this month.

F. L. Thomas (April 29): Boll weevil emergence has been a little more than 2 percent and is less than average in central Texas. Normally, half of the weevils that survive the winter have moved to the fields in search of cotton before May 1. This year's figures indicate that the emergence will be below normal.

R. W. Moreland (April 30): Weevils have been fairly active in cages at College Station since the rains of April 25 and 26, but none has been observed in the field.

K. P. Ewing, Port Lavaca. (April 9): Observations during the first week of April showed continued weevil activity in stubble cotton and punctured squares were becoming numerous.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Louisiana. R. C. Gaines (April 30): At Tallulah flea hoppers have been taken in sweeping evening primrose, but they are not as abundant as at this time last year.

Texas. F. L. Thomas (April 22): In central Texas the emergence of flea hoppers the latter part of March was, with two exceptions, the highest since 1920. During the first 2 weeks in April it was higher than in 1935, a flea hopper year, indicating that early cotton would have been subject to damage had it not been destroyed. Present indications are that flea hopper damage in central Texas may be reduced because of the lateness of the cotton crop. In northern Texas damage is not expected to be so severe as in 1937, as records show flea hoppers to have been only half as numerous in the fall of 1937 as in 1936. Such records constitute a good index of the numbers that will be present the following spring.

F. L. Thomas (April 29): During the last 2 weeks cotton flea hoppers appear to have been delayed in hatching. With two exceptions the hatch since April 15 has been the lowest for 12 years. Ordinarily 88 percent of the hatch occurs between March 15 and May 1. This year the numbers hatched during the 6-week period have been about three-fourths of normal. Late-hatched flea hoppers usually find their preferred weed-host plants in a desirable stage of growth, so that the customary early spring dispersal or migration becomes unnecessary and fewer of the insects reach the cotton fields. Both adults and young have been found in Dallas County, and hatching has begun in weeds collected from four counties and caged.

K. P. Ewing (April 23): At Port Lavaca emergence from the overwintering eggs in hibernation cages has been very low, only about one-eighth as great as in the previous 4 years. The movement to the fields, as indicated by the catch on flight screens, has been about three times as great as during the same period in the last three years. The heavy migration to the fields, despite low emergence, was probably due to the very warm and favorable weather until April 6, that was ideal for the maturity of the nymphs hatching in February and March. (April 30): Heavy emergence from hibernation cages since the rains on April 25. The peak of emergence is much later this year than ever before recorded in southern Texas.

Arizona. W. A. Stevenson (April 16): The first nymphs of cotton flea hoppers were found on small creton plants near Rillito, in Pima County. Plants were not numerous but hoppers were found on practically every one.

THRIPS (Thysanoptera)

Louisiana. C. O. Eddy (April): The flower thrips has been reported to be unusually abundant. No thrips damage on cotton as yet.

Texas. F. L. Thomas (April 22): Thrips numerous in most cotton fields of the lower Rio Grande Valley, where dry weather has occurred. Sufficient damage to delay development of plants has resulted in some fields.

K. P. Ewing (April 23): Report received from C. D. Dickey that onion thrips (Thrips tabaci Lind.) are causing great damage to cotton in the dry-land farming section of the lower Rio Grande Valley, particularly near Raymondville. A large acreage of onions was grown and the thrips transferred from the mature onions to cotton.

BOLLWORM (Heliothis obsoleta F.)

Texas. R. W. Moreland (April 2): At College Station no eggs have been found to date on plants other than alfalfa. (April 9): The first eggs were found on corn during the week. (April 16): Several moths emerged in hibernation cages during the week. (April 30): Eggs at the rate of 4 per 100 plants were found on corn on April 25, the first eggs found on corn since the rains on April 9 and 10. Emergence from hibernation cages averaged 22.5 percent, the highest emergence ever recorded at this date.

K. P. Ewing (April 23): At Port Lavaca numerous bluebonnet plants were examined for eggs during the week, with negative results.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. L. W. Noble (April 23): Practically all cotton is up to a good stand in the Big Bend area and shows no ill effects of the cold wave on the 8th and 9th. At Presidio pink bollworm moth emergence in hibernation cages continues to be exceptionally heavy, as compared to that in other years.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Texas. K. P. Ewing (May 2): One leaf worm about one-third grown was found in stubble cotton in Calhoun County. This is the earliest observation of first appearance since 1922. In 1936 the first appearance was on May 5, whereas in 1937 the leaf worm was not found until May 27.

F O R E S T A N D S H A D E - T R E E I N S E C T S

CANKERWORMS (Geometridae)

New York. N. Y. State Agr. Expt. Sta. Staff (April 22): Spring cankerworm (Palcaacrita vernata Peck) quite abundant on elms in certain nursery plantings in western New York. Egg laying is complete.

Pennsylvania. H. E. Hodgkiss (April 19): Cankerworm adults and eggs abundant throughout the State.

Arkansas. D. Isely (April 19): Spring cankerworms are in a number of orchards in northwestern Arkansas, the first time in 20 years that occurrence in commercial orchards has been recorded. It is probably due to the fact that there has been a let-up in orchard spraying.

Nebraska. M. H. Swenk (April 18): Inquiries as to preventive control of spring cankerworm were received the latter part of March from Douglas, Hamilton, and other counties.

Kansas. H. R. Bryson (April 25): Cankerworms are abundant in limited localities. They were reported as attacking elms in ravines near Manhattan, and as abundant near Paola.

Oklahoma. F. A. Fenton (April 22): Cankerworms have caused widespread damage to fruit trees in the State.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Vermont. H. L. Bailey (April 21): Eggs have hatched and young larvae were moving on April 20 and 21 at Springfield and Woodstock, Windsor County, in southeastern Vermont, and at Middlebury, Addison County, in western Vermont.

South Carolina. W. C. Nettles (April 26): Forest tent caterpillar is present in extra large numbers in the lower part of the State. Evidently some check on the abundance of the insect is not operating, as there was a bad outbreak last year and a more serious one this year. It is necessary to keep the windows of houses down to prevent the insect from coming in, from 15 to 20 caterpillars having often been found in 1 room. A letter from the county agent at Walterboro states that the outbreak in that county is the worst ever heard of; that last year they took the major part of the honey crop by defoliating black gum and tupelo trees; and that this year in the northeast corner of the county, near Cottageville, several species of oak, even blackjack, have been attacked and defoliated 100 percent. Other trees attacked are black gum, tupelo gum, sweet gum, cherry, and peach. (April 28): Defoliation of forest trees by forest tent caterpillar is conspicuous in various localities in the eastern part of the State.

Mississippi. C. Lylo (April 21): J. P. Kislanko sent specimens on April 1, reporting them as abundant on oak trees at Hattiesburg and southward; on April 21 H. Gladney reported them on oak at Pass Christian and Gulfport; and a correspondent at Lumberton, Lamar County, reported them as abundant in his orchard and nursery during the last few weeks, as well as on near-by forest trees.

FALL WEBWORM (Hyphantria cunea Drury)

Louisiana. B. A. Osterberger (April 15): Injury is very noticeable on willow trees in a swampy section of Ascension Parish.

SATIN MOTH (Stilpnotia salicis L.)

Washington. R. L. Furniss (April): On April 1 a few larvae were found leaving their hibernacula at South Bellingham and Sedro Wolley, in Skagit County. On April 16 nearly all larvae were still present in their hibernacula at Port Angeles, Clallam County, and a high mortality of overwintering larvae was noted in Cowlitz County.

Oregon. R. L. Furniss (April 22): A high mortality of overwintering larvae was noted in Washington, Polk, and Marion Counties.

CYPRESS

A SAWFLY (Susana cupressi Rohw. & Midd.)

California. R. E. Campbell (April 29): During the past week numerous complaints of damage to cypress trees or hedges in Alhambra, in southern California, have been received. Similar complaints have been received about this time of year for several years. (Det. by V. E. Williams.)

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

New Jersey. T. L. Guyton (March 27): Elm leaf beetle adults were numerous in a building at Bound Brook.

ELM SCURFY SCALE (Chionaspis americana Johns.)

Maryland. E. P. Felt (April 23): Elm scurfy scale was reported as abundant on a number of elms at Cambridge.

FIR

A TUSSOCK MOTH (Halisidota argentata Pack.)

Washington and Oregon. R. L. Furniss (April 22): This insect is rather abundant this year in Oregon and Washington. It has been noted locally on Douglas fir and Sitka spruce in Skagit and Pierce Counties in Washington, and in Yamhill, Washington, Benton, and Lane Counties in Oregon. Feeding was first noted on February 26, in Lane County.

LARCH

LARCH CASEBEARER (Collocophora laricella Hbn.)

New York. R. E. Horsey (April 15): At Rochester larch casebearer was observed on April 12, moving onto leaves and feeding on Dahurian larch, which leaves out a little earlier than other species. It was found feeding on Siberian, European, and Japanese larches on April 13. Not until April 15 was it found feeding on American larch. Although these larches are sprayed annually, the insects are numerous, especially on Japanese larch.

MULBERRY

EUROPEAN PEACH SCALE (Locanium persicae F.)

Arizona. O. D. Lebert (April 21): An extremely heavy infestation of peach scale was found on mulberry in the Phoenix area. Several large limbs of a tree were killed back and all small limbs and twigs were heavily infested.

OAK

GOUTY OAK GALL (Andricus punctatus Bass.)

Massachusetts, New York, and Pennsylvania. E. P. Felt (April 23): Gouty oak gall is reported as abundant in Pepperell, Mass., southern Westchester County, N. Y., and in the Philadelphia area of Pennsylvania.

OAK LECANIUM (Lecanium quercifex Fitch)

South Carolina. W. C. Nettles (April 28): Lecanium (soft scale) is noticeable on oaks.

Alabama. J. M. Robinson (April 23): The oak lecanium has been active in Auburn and central Alabama.

PINE

PINE TUBE MOTH (Argyrotaenia pinatubana Kearf.)

New York and New Jersey. E. P. Felt (April 23): The pine tube moth was found to be locally abundant at Moores Mill, Dutchess County, N. Y., and at Englewood, N. J.

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

Michigan. Ray Hutson (April 25): The European pine shoot moth has been reported from Detroit, in southeastern Michigan, and from Grand Rapids and Kalamazoo, in southwestern Michigan.

SAWFLIES (Neodiprion spp.)

Massachusetts. J. V. Schaffner, Jr. (April 14): In the fall of 1937 there was a heavy egg deposit by an unidentified species of Neodiprion in red pine plantations and in at least one natural stand in Middlesex County. In one heavily infested plantation at Groton, 47 infested tips of side branches contained 2,149 eggs, or an average of 45.7 eggs per tip.

Michigan. R. Hutson (April 25): European pine sawfly (N. banksianae Rohw.) has been reported as just hatching in Detroit.

SOUTHERN PINE BEETLE (Dendroctonus frontalis Zimm.)

Alabama. J. M. Robinson (April): The pine bark beetle was reported as killing some large pine trees at the University of Alabama.

PITCH EATING WEEVIL (Pachyllobius picivorus Germ.)

Florida. J. R. Watson (April 23): Numbers of this pitch eating beetle were sent in from Argyle, where they were reported as being very abundant.

PALES WEEVIL (Hylobius pales Hbst.)

Alabama. J. M. Robinson (April 14): Pales weevil was reported attacking spruce pines at Wedowee on April 14.

PINE BARK APHID (Pinus strobi Mtg.)

New York. E. P. Felt (April 23): Pine bark aphids (Chermes pinicorticis Fitch) were extremely abundant on white pines at Moores Mill, in southeastern New York.

A SCALE INSECT (Matsucoccus sp.)

Connecticut. T. J. Parr (April 22): Practically no winter mortality of the eggs on pitch pine in Connecticut, and the indications are that there will be nearly 100 percent hatch.

PRICKLY-ASH

PRICKLY-ASH BEETLE (Trirhabda brevicollis Lec.)

Mississippi. C. Lyle (April 1): On April 1 a correspondent at Gulfport, in Harrison County, sent larvae to this office, reporting that they were defoliating prickly-ash.

POPLAR

POPLAR VAGABOND APHID (Mordwilkoja vagabunda Walsh)

Nebraska. M. H. Swenk (April 18): Specimens of galls caused by the vagabond cottonwood gall aphid were sent in from Sioux and Box Butte Counties on April 9 and 12, respectively.

REDBUD

REDBUD APHID (Aphis pawneeae Mottes)

Kansas. H. R. Bryson (April 23): Redbud aphids were found at Manhattan, attacking the underside of the branches of 3-year-old redbud trees. This is the first reappearance for 2 or 3 years.

SPRUCE

SPRUCE NEEDLE MINER (Taniva albolineana Kearf.)

Michigan. R. Yutson (April 25): The spruce tortrix (Argyroploce abietana Fern.) is active about Lansing.

SUMAC

SUMAC FLEA BEETLE (Blepharida rhois Forst.)

Oklahoma. F. A. Fenton (April 22): The sumac beetle has been reported from Oklahoma City, Sand Springs, and Stillwater. Beetles are appearing in large numbers and are causing serious injury to sumac.

TULIPTREE

TULIPTREE SCALE (Toumeyella liriiodendri Gmel.)

Delaware. E. P. Felt (April 23): Tuliptrees at Wilmington are infested by ~~the~~ scale tuliptree scale. The scale-eating caterpillar Laetilia coccidiivora Comst. was evidently abundant.

WILLOW

BEETLES (Coleoptera)

Missouri. L. Haseman (April 25): Throughout central Missouri, during the second and third weeks in April, we had a very heavy flight of the spotted and striped poplar and willow beetles, and many poplar and willow trees are showing severe effects of their feeding. A similar condition prevailed a year ago.

INSECTS AFFECTING GREENHOUSE
AND ORNAMENTAL PLANTS

AN APHID (Myzus ornatus Laing)

California. E. O. Essig (April): The ornate aphid occurs in abundance on many wild and ornamental plants at Berkeley and specimens have also been discovered in Los Angeles County. This species was first discovered in California by the writer in 1936.

HAIRY CHINCH BUG (Blissus hirtus Montd.)

Pennsylvania. H. E. Hodgkiss (April 19): Adults of the hairy chinch bug are coming out of hibernation in the Philadelphia area.

MEALYBUGS (Pseudococcus spp.)

Maryland. E. N. Cory (April 19): Mealybugs were observed on house plants, particularly gardenias, at Baltimore on April 19.

Oklahoma. F. A. Fenton (April 22): The long-tailed mealybug (P. adonidum L.) was reported on house plants at Lookaba.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

Connecticut. E. P. Felt (April 23): Oystershell scale is locally abundant in southwestern Connecticut.

New York. R. E. Horsey (April 12): Oystershell scale was found on Scotch broom (Cytisus scoparius) at Rochester. One shrub in an ornamental planting was badly infested, with scattered scale on several others.

E. P. Felt (April 23): Oystershell scale was numerous on apple trees at Woodstock.

Utah. G. F. Knowlton (April 16): Willows at Cove and Logan are heavily incrustated with oystershell scale.

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. C. D. Lebert (April 21): California red scale was found in several small infestations on rockwork this month. The host plants were oleander, privet, and rose.

GROUND-PEARL (Margarodes spp.)

Florida. J. R. Watson (April 23): A species of Margarodes was sent in from Deland, where it was stated to be severely injuring lawns of centipede grass.

COMMON RED SPIDER (Tetranychus telarius L.)

Arizona. C. D. Lebert (April 21): Red spider has been observed in many heavy infestations on Italian cypress in the Phoenix area.

ARBORVITAE

ARBORVITAE APHID (Lachnus thujaefilina DelGuer.)

Arizona. C. D. Lebert (April 21): The arborvitae aphid has been observed in several ornamental plantings.

BOXWOOD

BOXWOOD LEAF MINER (Monarthropalpus buxi Laboulb.)

New York. E. P. Felt (April 23): Box leaf midge is somewhat abundant locally at Westbury, Long Island.

CEDAR

DEODAR WEEVIL (Pissodes nemorensis Germ.)

Mississippi. C. Lyle (April 12): Injury to Cedrus deodara was reported from Cary, in Sharkey County, on April 12.

CHRYSANTHEMUM

CHRYSANTHEMUM APHID (Macrosiphoniella sanborni Gill.)

Arizona. C. D. Lebert (April 21): The chrysanthemum aphid has been observed in heavy infestations in the Salt River Valley.

GARDENIA

WHITE FLIES (Aleyrodidae)

Virginia. H. G. Walker and L. D. Anderson (April 26): Whiteflies have been reported as quite injurious to a number of plantings of gardenias in Norfolk.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Florida. J. R. Watson (April 23): Proving very destructive in many gladiolus fields. One large planting in Dade County was reported to be an entire loss.

Mississippi. C. Lyle (April 5): Specimens on gladiolus were received from a correspondent at Gulfport, in Harrison County, on April 5.

HOLLY

HOLLY LEAF MINER (Phytomyza ilicicola Loew)

Maryland. E. N. Cory (March 23): The holly leaf miner was reported on holly at Annapolis.

IRIS

POTATO APHID (Illinoia solanifolii Ashm.)

Maryland. E. N. Cory (March 31): Macrosiphum gei was reported on iris at Snow Hill.

MAGNOLIA

A COLEOPTEROUS LEAF MINER (Prionomerus calceatus Say)

Mississippi. C. Lyle (April 4): A correspondent at Saucier, in Harrison County, sent specimens to this office on April 4, reporting that hundreds of them were present and feeding on new leaves of magnolia.

NARCISSUS

A NOCTUID (Xanthopastis timais Cramer)

Mississippi. C. Lyle (April): Larvae were received at this office on April 14 and 21 from correspondents at Puckett, in Rankin County, with the report that they were abundant on jonquils. Others were sent by another correspondent on April 19 without stating from what host they were taken.

NASTURTIIUM

SERPENTINE LEAF MINER (Agromyza pusilla Meig.)

Florida. J. R. Watson (April 23): Several complaints have been received of the work of serpentine leaf miners on nasturtiums.

OLEANDER

POLKA DOT WASP MOTH (Syntomeida epilais Walk.)

Florida. J. R. Watson (April 23): The oleander caterpillar is very abundant from Gainesville south.

RHODODENDRON

A WHITEFLY (Dialeurodes chittendeni Laing)

Connecticut. E. P. Felt (April 23): Rhododendron whitefly was somewhat abundant in a planting at Greenwich in the extreme southwestern corner of the State.

AZALEA SCALE (Eriococcus azaleae Const.)

Connecticut. E. P. Felt (April 23): Azalea scale occurred in large numbers on rhododendron at Hartford.

ROSE

ROSE APHID (Macrosiphum rosae L.)

New Jersey. M. D. Leonard (April 24): Rose aphids are becoming abundant on new shoots of various varieties of cultivated roses at Haddonfield, Camden County. All forms are breeding rapidly. This is earlier than usual.

SNOWBALL

AN APHID (Aphis viburniphila Patch)

New Jersey. M. D. Leonard (April 24): Leaves are curling badly already, at Haddonfield, Camden County. Stem-mothers and many young have been observed, attended, as usual, by ants.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MAN

MOSQUITOES (Culicinae)

Vermont. H. L. Bailey (April 22): Large numbers of larvae of Aedes spp. were found in snow-water pools at Salisbury and Leicester, Addison County, in western Vermont on April 7. In some pools where no larvae were found on that date, many were found on April 22.

Florida. B. V. Travis (April 1): Anopheles quadrimaculatus Say was rather abundant at Forshala plantation during the entire winter, but few have been observed since March 1, A. crucians Wied. having become the more noticeable species since that date.

J. B. Hull (April 1): Only a few Aedes sollicitans (Walk.) were found at Fort Pierce in January, February, and March.

Texas. E. W. Laake (April 25): Mosquitoes have apparently been very scarce during the last month.

Oregon and Washington. H. H. Stage (April 25): The first larvae of A. varipalpus Coq. were found on April 12 near Randall, Wash., in an oak stump filled with rain water. The first larvae of A. vexans Mg. and A. aldrichi Dyar and Knab were found on April 21 in the lower Columbia River Valley, as the Columbia freshet reached 12.0 feet. The first adults of Culex pipiens L. were seen at Mt. Angel, Oreg., on April 19. The first anopheline larvae were found in the first instar at Tulatin, Oreg., on April 27. The first larval C. tarsalis Coq. was observed in the Willamette Valley at Tulatin on April 27. Third-instar larvae were taken.

BUFFALO GNATS (Simuliidae)

New York. R. Matheson (April 23): Prosimulium hirtipes Fries, called the "Adirondack black-fly," during the last few years has made its appearance in unusual abundance about Ithaca and is fast becoming a pest of first importance about homes, both in the city and surrounding country. It is very annoying about cottages on the west shore of Cayuga Lake. The first appearance this year was on April 23 and it is quite abundant in the region at such an early date.

California. A. E. Michelbacher (April 20): Buffalo gnats, Eusimulium clarum D. & S., have been found to be very abundant about Patterson and Westley, in the San Joaquin Valley. They were first encountered on March 14 and again on March 24. They literally swarm about a person and are very annoying. They do not bite but get into the hair and eyes. (Det. by A. Stone.) They were continuing abundant up to April 20, being encountered at Modesto, Patterson, Westley,

Vernalis, and Tracy. A few were found at Pleasanton.

EYE GNATS (Hippelates spp.)

Florida. J. T. Bigham (April 26): Eye gnats and sore eyes were reported very troublesome in January, February, and March, at Okeechobee, just north of the lake, and at all points around the eastern and southern shores of the lake. There was not much trouble with them at Moore Haven, toward the western side. Gnats are said to be scarce throughout the low, flat country northwest of Moore Haven until higher ground is reached about 12 miles south of Lake Placid. From this point northward along the Ridge to Haines City, a great deal of trouble was reported every place with gnats and sore eyes. They were abundant enough to be bothersome in school rooms. Sore eyes are said to be most prevalent in the spring from Sebring south. Although trouble from gnats or sore eyes was not reported at all points along the highway skirting the east coast of Florida, an abundance of them was reported in truck fields in southeastern Florida on the edge of the Everglades, only a few miles inland. A status trap, located 3 or 4 miles inland from Fort Pierce, indicated the presence of considerable numbers of gnats in that locality. Eye gnats were not abundant in the area between Orlando and Tallahassee, in the low flat country toward the northwest coast near Perry, but they were very abundant in the higher country north of there, through Monticello, Madison, and Live Oak.

MIDGES (Chironomus spp.)

Vermont. H. L. Bailey (April 22): Great numbers of mosquitolike midges were present in the vicinity of Lake Dunmore, Addison County, western Vermont, on April 22.

SANDFLIES (Culicoides spp.)

Georgia and Florida. J. B. Hull (April): Very few sandflies were observed in the vicinity of Savannah, Ga., in January, except for a few warm, cloudy days when they were numerous near the salt marshes. Few sandflies were present that month in Fort Pierce, Fla., although they were numerous during the last week of December. The same conditions were observed during the early part of February at both stations, although one complaint was received from a resident on the island east of the city of Fort Pierce, Fla. During the latter part of February and in March at Savannah, Ga., sandflies were more numerous than at any time since 1935. Early in the morning and late in the afternoon it was almost impossible to remain out of doors, especially near the marshes. They were annoying as far as 2 miles from the marshes on cloudy days when the wind was not blowing. Collections made by sweepings showed that C. canithorax Hoff. constituted over 98 percent of the flies. During the same period

some complaints were received at Fort Pierce, especially from workers on the island east of there, and residents living along the Indian River. Some of the workers on the island quit work on account of the flies.

TROPICAL RAT MITE (Liponyssus bacoti Hirst)

Kentucky. Dorsey Drug Co. (April 19): Mites were found on rats in Horse Cave on April 11. (Det. by H. E. Ewing.)

AMERICAN DOG TICK (Dermacentor variabilis Say)

Massachusetts. C. N. Smith (April 1): All stages of the American dog tick became active towards the end of March on Martha's Vineyard Island. The first adults were found March 21 and a few specimens have been taken daily since that time. The first larvae appeared on March 21 and a single nymph was taken on March 29.

District of Columbia. F. C. Bishopp (April 26): It is indicated from reports received from residents of the District and outlying suburban areas that the American dog tick made its first appearance about April 1, and that it has been building up quite rapidly since.

ROCKY MOUNTAIN SPOTTED FEVER TICK (Dermacentor andersoni Stiles)

Washington. M. C. Lane (April 19): The Rocky Mountain spotted fever tick was abundant in the foothills of the Blue Mountains on April 15.

CATTLE

STABLEFLY (Stomoxys calcitrans L.)

Georgia. A. L. Brody (April 13): The stablefly has been annoying to cattle around Valdosta. Usually from 25 to 50 are observed on each head of cattle.

Texas. E. W. Laake (April 25): The stablefly apparently varies in abundance at different places in the vicinity of Dallas and Fort Worth, and ranges from 2 or 3 flies per animal, where the cattle graze in open pastures, to as high as 50 per head, where the animals are around barns or corrals.

HORN FLY (Haematobia irritans L.)

Georgia. A. L. Brody (April 13): Horn flies have not increased in numbers during the past month at Valdosta. The usual number seen on steers in this locality ranges from 100 to 200 per animal.

Texas. E. W. Laake (April 25): By April 1 horn fly populations of 2,000 per head on cattle were common in the vicinity west of Fort Worth, Tex., and about 500 per head were observed on cattle at

dairies around Dallas. After the cold wave of April 6 to 10, the population was reduced at least 50 percent and probably 75 percent. Since this cold spell, the population has again increased but apparently has not yet reached the abundance that occurred just before the cold weather mentioned above. The horn fly passed the winter in Dallas in the pupal stage, as evidenced by the emergence of flies after March 30, from material kept in hibernating cages.

O. G. Babcock (April 22): The infestation in the vicinity of Sonora is from light to medium, that is, from 25 to 500 per animal.

HORSE

BLACK HORSEFLIES (Tabanus spp.)

Texas. E. W. Laake (April 25): The first specimen of T. atratus F. was observed on an animal on April 18 at the laboratory at Dallas. Another specimen was observed feeding on a sheep on April 21. A specimen of another species, apparently T. lineola F., was caught in the cattle-fly trap on April 20. Three individuals of this species were taken in the cattle-fly trap operated on the laboratory premises during the week ending April 25.

A BUFFALO GNAT (Simulium vittatum Zett.)

Nebraska. M. H. Swenk (April): On March 24 a Clay County correspondent sent in specimens of the black fly with the statement that this fly was a very serious pest of horses, entering their ears and irritating the membranes. This pest was first noticed on this farm by the correspondent 3 or 4 years ago. A similar complaint was received from Thurston County on April 16.

WINTER TICK (Dermacentor albipictus Pack.)

Oregon. H. H. Stage (April 5): Range horses were moderately infested with these ticks near John Day. No D. andersoni were seen at this time. (Det. by J. M. Brennan.)

POULTRY

EUROPEAN CHICKEN FLEA (Coratophyllus gallinae Schr.)

New York. R. Matheson (March 30): C. gallinae was reported at Gasport in northwestern New York, for the first time.

STICKTIGHT FLEA (Echidnophaga gallinacea Westw.)

Alabama. J. M. Robinson (April 16): The chicken flea was reported from Lanett on April 16.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

Connecticut. N. Turner (April 23): The usual large number of infestations of R. flavipes Koll. has been reported. Flights have been general during the last month. Many comparatively new buildings are seriously infested.

Rhode Island. A. E. Stone (April 21): There have been two complaints of invasions by termites in Providence, apparently starting the same time as in previous years.

New York. E. P. Felt (April 23): Termites, R. flavipes, were abundant in a house at Brewster.

Pennsylvania. H. E. Hodgkiss (April 19): Winged termites have been taken around Pittsburgh and Philadelphia during the last 3 weeks.

Maryland. E. N. Cory (March and April): Termites have been reported in houses in Baltimore City and County, College Park, Silver Spring, Hagerstown, and Anne Arundel County, during the last 2 months.

South Carolina. W. C. Nettles and F. Sherman (April 23): For whatever reason, complaints and inquiries about termites are now less than usual at this season.

Illinois. W. P. Flint (April): Termites have been swarming during the last month, both from heated buildings and outside. Many swarms have been reported from the central part of the State.

Michigan. R. Hutson (April 25): Termites, particularly R. flavipes, have been reported from Grand Rapids and Coldwater.

Missouri. L. Haseman (April 25): While the swarming of termites throughout the State began in March, some property owners have continued to report swarming up until the third week in April.

Nebraska. M. H. Swenk (March 29): Termites, R. tibialis Banks, were reported as requiring control in Buffalo County on March 29.

Oklahoma. F. A. Fenton (April 22): Termites have been reported at Oklahoma City, Okmulgee, Shawnee, and Nowata. The past warm spell has caused these insects to swarm in large numbers in the vicinity of Stillwater.

Texas. E. W. Laake (April 25): During the last 2 weeks, from 6 to 12 calls per week have been received at the laboratory for information on the control of termites in residences in the city of Dallas.

LEAD CABLE BORER (Scobicia declivis Lec.)

California. D. F. Barnes (April 20): A rotary net, set in operation on April 14 in a storage yard at Fresno began to take these beetles on April 17 and 18. Two were captured during this 2-day period and 47 on April 19.

BROWN SPIDER BEETLE (Ptinus brunneus Duft.)

Ohio. T. H. Parks (April 22): Specimens were sent in with the statement that they were being taken commonly in rooms of occupied houses in Union and Highland Counties: (Det. by J. N. Knull.)

A CURCULIONID BEETLE (Hexarthrum ulkei Horn)

Connecticut. N. Turner and M. P. Zappe (April 23): Yellow pine trim in a New Haven building has been badly damaged by this insect. Some ash trim was also infested. The building is about 30 years old. (Det. by L. L. Buchanan.)

A SHOT-HOLE BORER (Dinoderus minutus F.)

Ohio. J. N. Knull (March 30): Bamboo sticks imported from Japan by a Columbus florist were found to be heavily infested with larvae and adults on March 30. (Det. by W. S. Fisher.)

PEA WEEVIL (Bruchus pisorum L.)

North Carolina. J. S. Pinckney (April 20): Two adults were swept from a row of Austrian winter peas on the Experiment Station grounds at Statesville this morning. This bruchid, like B. brachialis Fahraeus, is evidently just emerging from hibernation quarters.

A SPIDER BEETLE (Gibbium psylloides Czemp.)

New York. M. D. Leonard (April 24): Beetles are occurring in fair numbers in New York City and their presence **is causing annoyance.**

INDIAN-MEAL MOTH (Plodia interpunctella Hbn.)

Nebraska. M. H. Swenk (April 7): From Knox County on April 7 came a specimen of Indian-meal moth for identification and control measures.

Utah. Mrs. O. N. Smith (April 21): These insects get under the covers and paraffin on any seedy fruit jams, and from one-third to one-half of the jam is liquidlike and spoiled. (Det. by C. Heinrich.)

SUGARCANE BEETLE (Euetheola rugiceps Lec.)

Louisiana. B. A. Osterberger and C. O. Eddy (April): Very active in Saint Mary Parish. The adults are feeding on sugarcane and corn. In the Bayou Teche section in some fields fully 80 percent of the original sugarcane plants have been destroyed. No reports of this pest have yet come in from northern Louisiana.

J. W. Ingram and L. J. Charpentier (April 23): At Franklin beetle injury is the heaviest since 1933. Injury reached its peak about the middle of April. Recent rain in the section suffering heaviest injury has been of benefit in increasing suckering of injured plants.

SUGARCANE ROOTSTOCK WEEVIL (Ana centrinus subnudus Buchanan)

Louisiana. B. A. Osterberger (March 30): In Saint John the Baptist and East Baton Rouge Parishes this insect has been noticed on several occasions moving about on the ground in sugarcane fields, as if migrating from trash in middles to the growing cane.

NOTES ON TOBACCO INSECTS IN 1937

By W. C. Nettles

Chairman Survey Committee, Tobacco Insect Council 1/

Introduction

On July 8, 1937, the entomologists interested in the control of tobacco insects met in Florence, S. C., and organized the Tobacco Insect Council. In connection with the work of this group of entomologists, a committee was appointed to make a survey of the distribution and abundance of the principal tobacco insects in 1937. It is expected that in the future surveys the committee will be able to present more detailed reports. The need for making an annual survey of the insects infesting tobacco in the States where it is grown was recognized and plans are under way for making this a more detailed survey.

TOBACCO FLEA BEETLE (Epitrix parvula F.)

Hibernation

At Oxford, N. C., an infestation on the edge of a woods showed 3.5 beetles per square foot in December 1936 but only 0.6 beetle per square foot in March 1937. Records from hibernation cages indicated that beetles were active in February.

There was a recovery of living beetles in 1937 of 24.1 percent from muslin-covered cages located in the edge of a woods and 33.6 percent in similar cages located from 6 to 8 feet within the woods. In the spring of 1936 there was a recovery of 47.3 percent in cages located from 6 to 8 feet within the woods and placed over the natural undisturbed litter, and the greatest percentages of beetle recovery occurred in cages having the smallest quantities of litter on the soil surface.

1/ For assistance in assembling these notes on tobacco insects, the writer is indebted to the members of the Survey Committee of the Tobacco Insect Council as follows: W. A. Shands, North Carolina; J. O. Rowell, North Carolina; H. H. Jewett, Kentucky; L. B. Scott, Tennessee; W. W. Stanley, Tennessee; and W. E. Britton, Connecticut.

At Florence, S. C., tobacco flea beetles were active on January 23 in muslin-covered cages located in the edge of a woods. The recovery of living beetles during the spring ranged from 0 to 41 percent in individual cages. The lowest recoveries were from cages in which the beetles had been placed late in September 1936.

The earliest recorded activity of the tobacco flea beetle in Tennessee was on April 12.

Plant Beds

During the latter part of March a survey of 47,350 square yards of plant beds in eastern North Carolina showed that flea beetle damage was severe in poorly constructed beds. Of 18 beds examined, 7 had from 0 to 40 beetles per square foot. No attempt was made by growers to control the beetles in the beds examined. In 8 counties of north-central North Carolina from 80 to 100 beds were examined and beetle populations ranged from 8 to 45 per square foot.

Owing to unseasonably warm weather in January and February in South Carolina, seeds germinated early and plants made an early growth. The first beetle injury in the beds was observed on February 25, near Loris. During March injury in plant beds was common. A maximum infestation of about 46 beetles per square foot was found on 1 bed, and injury was more pronounced where the beds were poorly constructed.

Observations made in the tobacco districts of Georgia and Florida showed the populations of tobacco flea beetles to be heavier in all periods of growth of the crop than in 1936.

In Tennessee and Kentucky the damage by flea beetles in plant beds was reported to be severe.

Plants in the Field

Counts in fields of newly set plants over southeastern North Carolina late in March and in April showed infested plants ranging from 20 to 100 percent in the various fields examined. Similar counts made in 1936 indicated that beetles were more numerous on newly set tobacco than in 1937. Severe injury by adults and larvae on newly set tobacco occurred in the northwestern and north-central parts of North Carolina. Loss in stand was heaviest in Surry, Stokes, Yadkin, Forsyth, and Guilford Counties. The injury was also common but less severe in Person and Granville Counties. In localities where the plants were most severely injured replanting was carried out as many as six times. Some of the fields were plowed and seeded to other crops. Some of this injury could be attributed to diseases, methods of culture, and weather conditions. Apparently three broods of beetles were produced in tobacco fields in North Carolina. The general abundance of beetles and severity of injury on the mature tobacco appeared not to vary greatly from that in 1936.

Owing to cool weather and previous injury from downy mildew, tobacco that was transplanted the latter part of March and the first part of April in South Carolina made slow growth, and flea beetle injury in many instances was severe. This made a large number of replantings necessary and resulted in an uneven growth of plants. No survey of the tobacco-growing area in South Carolina was made in 1936 or 1937, but flea beetle outbreaks were serious in some sections of the State. Injury to the tobacco in the fields in Horry County was severe during the growing season of 1937. Severe injury to growing plants in the fields was reported from many sections of the State in July.

In Tennessee the peak of abundance of flea beetles in tobacco fields was reached during the period August 1 to 7, at which time a survey at Knoxville showed an average of 16 beetles per plant.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

The overwintered brood of potato flea beetles appeared in the tobacco fields of Connecticut about the first of June. The peak of abundance of adults was reached in the fields during the period July 6 to 18. Owing to the application of control measures, the populations in shade tents were not large. This insect was the most destructive pest of tobacco in the Connecticut River Valley in 1937.

HORNWORMS (Protoparce spp.)

Hibernation

In 1937 at Oxford, N. C., there was a recovery of 436 moths or 19.66 percent of the larvae that were placed in hibernation cages in September 1936. The numbers of male and female adults recovered from the cages in 1936 were approximately equal, and the greatest emergence occurred in mid-August. A total of 750 hornworm moths were collected during 1937 in 9 traps, with heaviest catches on August 18. From moths taken in the traps it was found that about 75 percent were the tomato hornworm (P. sexta Johan.) and the remainder the tobacco hornworm (P. quinquemaculata Haw.). Of the adults of P. sexta caught, about 66 percent were males, while only about 60 percent of the P. quinquemaculata were males.

Field Injury

Larval injury in 1937 was probably more abundant in the vicinity of Oxford than in 1936. The period of most severe injury was late in August, which was soon after trap catches indicated the greatest abundance of moths. This injury occurred after about one-half to two-thirds of the plant had been harvested.

The hornworms were present in destructive numbers in many parts of South Carolina tobacco districts. No figures are available on the damage that resulted. Two species of predacious wasps on hornworm larvae were reported. These were determined as Polistes canadensis annularis L., and Polistes fuscatus rubiginosus Lep.

Larvae of the hornworms attacking tobacco were abundant in tobacco fields around Knoxville, Tenn., during the period August 12-September 13, reaching the peak of abundance on the station farm on August 31. The population counts showed 80 larvae on units of 50 plants, or 1.6 larvae per plant, in untreated fields.

The spring brood of adults of the tomato hornworm on tobacco began around April 25 in the Florida-Georgia tobacco districts. The first generation of adults emerged in June and the second generation the latter part of July. The populations increased in each brood, but during the latter part of August and September these insects largely disappeared from tobacco fields. By the first of October adults were difficult to find.

In Connecticut the late fields of tobacco and suckers in harvested fields were heavily attacked by larvae of P. quinquemaculata. This was an unusually heavy infestation for this section.

A heavy infestation of the hornworms appeared in Maryland at about harvest time and severe losses resulted in many tobacco fields. Damage was reported also in the barns where the stalks were cut and hung for air curing.

BUDWORMS (Heliothis spp.)

In the Florida-Georgia tobacco districts the tobacco budworm (H. virescens F.) was present in about the same numbers as in 1936. Owing to the efficient manner in which control measures were applied by the growers of cigar tobaccos, highly destructive populations were not present in tobacco fields.

The tobacco budworm (H. virescens) and the corn ear worm (H. obsoleta F.) on tobacco were abundant in North Carolina around July 1 but, owing to the effective application of control measures, the insects were brought under control in most fields.

During June and July severe outbreaks of the budworms were reported on tobacco in many sections of the South Carolina tobacco districts.

The budworms on tobacco were reported from Tennessee and Kentucky but no unusual outbreaks occurred on the burley and dark fire-cured tobaccos.

H. virescens was observed in small numbers in fields of sun-grown tobacco in Connecticut.

TOBACCO THRIPS (Frankliniella fusca Hinds)

This insect is of greatest economic importance in the shade-grown cigar tobacco districts of Connecticut and Florida. Severe damage was reported from Florida in 1936 but in 1937 little damage was reported, owing apparently to more abundant rainfall. Heavy damage was reported from the shade tobacco districts of the Connecticut River Valley, including the States of Connecticut and Massachusetts. The damage was observed to be most severe around the edges of fields bordering on grasslands.

CUTWORMS (Noctuidae)

Cutworms were reported to be inflicting important damage to tobacco plant beds in 1937 from South Carolina, North Carolina, Connecticut, Tennessee, and Kentucky. In North Carolina the identified species found injuring tobacco plants were as follows: Feltia subgothica (Haw.), Lycophotia margaritosa saucia Hbn., Parastichtis bicolorago Guen., and Agrotis ypsilon (Rott.).

The species reported most destructive in Connecticut were the dark-sided cutworm (Euxoa messoria (Harr.)) and the climbing cutworm (Agrotis c-nigrum (L.)).

WIREWORMS (Elateridae)

Wireworms were observed in North Carolina and South Carolina, inflicting severe damage on newly set plants. The species involved were not identified. In South Carolina fields were examined which showed that from 70 to 80 percent of all the newly set plants were attacked by wireworms. Severe injury to newly set plants was observed also from some sections of North Carolina.

Wireworms, the principal species of which was Limonijs agonus Say, inflicted severe damage to newly set plants of cigar tobaccos in Connecticut in 1937.

VEGETABLE WEEVIL (Listroderes obliquus Klug)

The vegetable weevil was found attacking young tobacco plants in the seedbeds at Quincy, Fla. This is the first record of the appearance of this insect as a pest of tobacco in the United States.

MISCELLANEOUS INSECTS

Grasshoppers were reported in destructive numbers from Tennessee, North Carolina, and Connecticut.

White grubs, Cotinis nitida (L.), and mole crickets, Scapteriscus spp., were serious pests of tobacco plant beds in South Carolina and sections of the Florida-Georgia tobacco districts.

In North Carolina midges, Chironomidae, and the black European slug (Agriolimax agrestis L.), were present in injurious numbers in tobacco plant beds.

The following soil-inhabiting insects were destructive to newly set tobacco plants in Connecticut: The seed corn maggot (Hylemyia cilicrura Rond.) and the crane fly (Nephrotoma sodalis Loew).

Infestations of the root aphid Trifidaphis phaseoli Pass., on the roots, and of the tarnished plant bug (Lygus pratensis (L.)), on the leaves, were reported on the growing crop in Connecticut.

INSECT PEST SURVEY BULLETIN

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THE MORE IMPORTANT RECORDS FOR MAY

From the Northern Rocky Mountain area southeast to Illinois hatching of grasshoppers has been delayed by recent rains, although mortality due to rains has been slight. A hatch of 60 percent was reported from the southern part of the grasshopper-infested territory. Campaigns are being conducted in the areas infested by Dissosteira longipennis Thos. in Colorado, New Mexico, and Texas, with migration reported from abandoned lands in New Mexico.

The Mormon cricket has largely hatched and control operations have been started in Utah and Nevada.

The cool, rainy weather east of the Rocky Mountains has been conducive to cutworm injury, and reports of unusual abundance have been received from almost every State.

The armyworm infestation reported last month has extended to include Oklahoma and Missouri, southern Illinois and Indiana, western and central Kentucky, and western Tennessee. In these areas the caterpillars are damaging small grains, corn, and pasture. Moths were observed throughout Ohio, Indiana, and Illinois, and also in Utah, New York, and Maine. An additional small area where damage is occurring extends from northeastern North Carolina, along the Atlantic coast through Virginia and Maryland.

The cool weather accompanied by frequent rain has been unfavorable to chinch bug development and damage this year is as yet undeterminable. The insect was reported in scattered locations in much of the chinch bug belt, where damage is anticipated in occasional areas.

The hessian fly has been favored by the spring weather and populations have built up considerably, resulting in some damage to wheat.

The corn ear worm was reported injuring sweet corn and tomato in South Carolina, Mississippi, Louisiana, and California. Moths were observed at New Brunswick, N. J., on May 13.

The codling moth began emerging earlier than usual, being observed the last week in April along the Ohio River and in northeastern Kansas and northwestern Missouri, also in the Middle Atlantic States. The peak of moth emergence occurred the first week in May. Cool, wet weather delayed development, but some hatching and a few entrances were observed by the middle of the month. The first adults were observed on May 17 and 18 in New York. In the Yakima Valley, Wash., the emergence started about the same time as in the eastern part of the country.

The rosy apple aphid is more abundant than usual in the Middle Atlantic States and in the Ohio Valley. The other species of apple aphids are occurring in only moderate abundance. The black peach aphid is more abundant than usual in the Middle Atlantic States.

Flea beetles are very abundant on and injurious to truck crops over the entire country.

The Colorado potato beetle is appearing earlier than usual and is causing considerable injury over the Middle Atlantic States and in the Mississippi and Ohio Valleys. The insect was also reported from southeastern Idaho, where it has never been observed before.

The Mexican bean beetle is coming out of hibernation earlier than usual. Egg masses were found on May 5 in southern Indiana.

The pea aphid is very abundant along the Atlantic coast from Virginia to New York; however, it is not so injurious as it was last year. Considerable injury to peas is occurring in southern Wisconsin and Illinois and to alfalfa in the Western States.

Boll weevils were moderately abundant in the field over most of the Cotton Belt.

The cotton leaf worm appeared in Texas earlier than usual.

Thrips of many species are unusually abundant on truck crops, cotton, and flowers over most of the country.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

Illinois. W. P. Flint (May 23): There is less than 25-percent hatch in the sand areas and not more than 5 percent in other areas in central Illinois. The numbers of hoppers are not great enough to cause serious damage.

Michigan. R. Hutson (May 26): Camnula pellucida (Scudd.) is hatching all over the northern end of the Lower Peninsula and beginning to hatch in the Upper Peninsula. Hatching began in the week of April 18 in favored locations throughout the Lower Peninsula. Hatching of Melanoplus mexicanus (Sauss.) and M. femur-rubrum (Deg.) did not begin until a week to 10 days after the time when Camnula was first observed. Cold weather during the week beginning May 16 practically eliminated nymphs of all species hatched prior to that time. A sufficient reserve of eggs remains to form the basis for a heavy infestation.

Minnesota. A. G. Ruggles (May 19): Less than 1 percent of red-legged grasshopper and the two-striped (Melanoplus bivittatus Say) have hatched.

Iowa. C. J. Drake (May 27): Heavy rains and cool weather have greatly delayed grasshopper hatching. In central Iowa incubation is just beginning and not over 10 percent of the eggs have hatched in the southernmost counties. Late fall plowing of infested clover fields did not materially affect grasshopper eggs. Populations of over 200 young hoppers per square yard have been found in newly seeded alfalfa fields in a number of counties.

H. E. Jaques (May 25): Grasshoppers are now hatching in large numbers throughout much of southern Iowa.

Missouri. L. Haseman (May 23): Conditions have been decidedly unfavorable for grasshoppers during the second half of May. It was indicated that 50 percent or more of the lesser migratory eggs (M. mexicanus) hatched during the first few days in May, but hatching has slowed down in the last 2 weeks and conditions have not favored the young nymphs. Eggs of the differential grasshopper (Melanoplus differentialis Thos.) are still largely unhatched. In some places the lesser migratory nymphs are half grown or larger.

North Dakota. J. A. Munro (May): Hatching has been general throughout the State, with more than 75 percent of the eggs hatched in southwestern counties. Crop injury to alfalfa, sweetclover, and cereals reported in southern counties. A week of cool, rainy weather has retarded hatching and feeding activities.

South Dakota. H. C. Severin (May 20): Eggs of M. mexicanus were the first to hatch. It is estimated that as high as one-third of the

eggs are hatched in some localities. The first damage was reported on May 10 in Marshall County by first- and second-instar nymphs. The first damage caused by M. bivittatus was reported on May 12 from the northern and western sections of the State.

Nebraska. M. H. Swenk (May 20): Grasshopper eggs began hatching freely early in May, and probably from 25 to 30 percent have hatched. Heavy populations are developing in many localities.

Kansas. H. E. Hungerford (May 23): Young grasshoppers are beginning to be generally **troublesome** in flower gardens.

J. R. Horton (May 3): The first grasshoppers hatched around Wichita were seen during the last week of March. Only individuals and small groups have been seen as yet and there is no damage to spring wheat, which has been above ground only a few days.

Arkansas, Oklahoma, and Texas. W. E. Dove (May 14): All species are at least 60 percent hatched, being confined for the most part to field margins and original hatching grounds. Different species were found as follows: M. mexicanus in the fourth and fifth instars and as adults; M. differentialis in the first, second, and third instars; M. bivittatus in the third, fourth, and fifth instars; and Dis-sosteira longipennis Thos. in the first instar.

Oklahoma. F. A. Fenton (May 20): The grasshopper infestation promises to be more serious in many localities than the infestation last year. In places in Kay County M. mexicanus occurs at the rate of 100 per square foot. M. confusus Scudd. is in the adult stage and is very abundant in some places.

C. F. Stiles (May 25): Approximately 80 percent of grasshopper eggs have hatched and reports of crop injury are being received from southwestern Oklahoma. The principal species are M. mexicanus and M. differentialis. The situation is becoming alarming in five counties, where the rainfall was light until recently.

Texas. F. L. Thomas (May 25): Grasshoppers constitute a serious threat to all crops in northwestern Texas.

Montana. H. B. Mills (May 19): In some areas approximately 40 percent of the hoppers had hatched by May 7. Hatching has been considerably retarded.

Colorado. S. C. McCampbell (May 23): Hatching has been delayed over our native hopper area, where less than 1 percent hatch has occurred. From 5- to 25-percent hatch has occurred on the warmer soils in the migratory-grasshopper area.

Arizona. C. D. Lobert (May 26): Several heavy infestations of M. mexicanus in alfalfa were observed during the middle of May in the Salt River Valley.

Idaho. J. R. Douglass (May 5): Grasshoppers were beginning to hatch in the Snake River Plains at the end of April.

Utah. G. F. Knowlton (May 12): Hatching has been noticed in fields in northern Utah. (May 14): Hippiscus corallipes (Hald.) is now adult in the foothills of Tooele, Juab, and parts of Millard Counties, in central Utah. (May 23): Grasshoppers are beginning to damage alfalfa and pasture lands in southwestern and south-central Utah.

MORMON CRICKET (Anabrus simplex Hald.)

North Dakota. J. A. Munro (May 24): Emmons County, in south-central North Dakota, is heavily infested with recently hatched Mormon crickets. These pests were also found at the rate of 300 per square yard along field margins near Reeder, in Adams County, in the southwestern part of the State.

South Dakota. H. C. Severin (May 20): Mormon cricket eggs began hatching on April 19 in Lyman County, in south-central South Dakota, and on May 20 in Butte County, in the west-central part of the State. No damage reported as yet.

Montana. H. B. Mills (May 19): Mormon crickets have largely hatched in the lower areas and indications are that they will be as abundant, if not more so, than they were last year.

Utah. C. J. Sorenson (May 19): Mormon crickets have occurred in numbers menacing to agricultural crops in Juab, Millard, and Tooele Counties in west-central Utah. Crop damage is being prevented by control measures.

Nevada. G. G. Schweis (May 5): Mormon crickets have hatched on the lower and intermediate elevations in eastern Nevada and control work was started on a large scale on May 5.

CUTWORMS (Noctuidae)

Maine. H. B. Peirson (May 10): The variegated cutworm (Lycophotia margaritosa saucia Hbn.) was doing severe damage to greenhouse plants in Bar Harbor.

New Jersey. J. B. Schmitt (May 24): Cutworms are becoming serious in Burlington County, some cornfields showing 10-percent destruction.

Delaware. L. A. Stearns (May 19): The death of 70 percent of a new planting of peaches near Bridgeville is attributed to girdling of the young trees by cutworms. The field had been in watermelons in 1937 and cutworms had been abundant then.

Maryland. E. N. Cory (May 24): Cutworms have been damaging tobacco in Calvert County.

Virginia. H. G. Walker and L. D. Anderson (May 25): Cutworms have been unusually abundant near Norfolk since the latter part of April. They have cut off a great many tomato, bean, and corn plants, and have been very numerous in alfalfa fields.

South Carolina. J. G. Watts (May): An unidentified cutworm has been found in great abundance in a field of soybeans near Blackville, in the southwestern part of the State. The beans followed rye and vetch, planted as a winter cover crop. A maximum of 21 cutworms was found around a single hill. The same species has been found in much smaller numbers damaging cotton, corn, and tomatoes.

Georgia. O. I. Snapp (May 18): Near Fort Valley, in central Georgia, cutworms have destroyed 50 acres of young corn, planted after Austrian winter peas had been plowed in, and also damaged cotton and peppers under the same conditions. Truck crops in the same locality are damaged.

G. F. Moznette (May 19): Cutworms are destroying corn, peanuts, and cotton in scattered fields in the vicinity of Leary. Infestations are most severe where winter cover crops of vetch and Austrian peas have been plowed under, as many as 12 larvae being taken from a single peanut plant.

T. L. Bissell (May 23): Cutworms, possibly the variegated cutworm, have seriously injured one field of cotton at the experiment station and are less injurious in two other fields. These fields were planted after vetch and the same cutworm is found around vetch plants not yet plowed.

Indiana. J. J. Davis (May 23): Cutworms have been rather general throughout the State, attacking a wide range of crops, principally garden crops.

Ohio. T. H. Parks (May 19): The first serious outbreak of the bronzed cutworm (Nephelodes emmedonia Cram.) since 1925 was brought to our attention on May 13, when it was found to be destroying bluegrass in permanent pastures in eastern Franklin and western Licking Counties, in central Ohio. About 35 acres of bluegrass had been eaten close to the ground in one large pasture field by May 17. The line of demarcation between the infested and uninfested parts of the field was very distinct. At this point the larvae were massed beneath the grass and were progressing slowly into the new feeding grounds, destroying the grass as they went. Most of the larvae were about full-grown and would soon become quiescent. By May 15 many of the worms had been killed by a bacterial disease and by May 19 the outbreak was subsiding.

Illinois. W. P. Flint (May 23): Cutworms of various species particularly the black (Agrotis ypsilon Rott.) and the clay-backed (Feltia gladiaria Patch) have been causing generally serious losses to early planted corn. The injury has been complicated by the fact that the variegated cutworm (L. margaritosa) and the true armyworm

(Cirphis unipuncta Haw.) are present in equal numbers and the rank growth of clover in many fields has prevented success with control measures.

Michigan. R. Hutson (May 26): Cutworms have been reported active in the following localities: Parastichtis bicolorago Guen. in the vicinities of Parma and South Haven; Nephelodes emmedonia Cram., South Haven; Paragrotis scandens Riley, Albion, Parma, South Haven, Lawton, Paw Paw, Saint Joseph, Berrien Springs, Grand Rapids, and Fennville; Agrotis c-nigrum (L.), Parma; Agrotis unicolor (Walk.), Muskegon Heights and Manistee; and Feltia ducens (Walk.) at Parma, Albion, Coldwater, Niles, Berrien Springs, Paw Paw, Saugatuck, Fennville, Allegan, and Grand Rapids.

Alabama. J. M. Robinson (May 19): The variegated cutworm was causing damage on May 11 to young cotton after the cutting of alfalfa on the northern border of the State. New hay being shipped into Birmingham from southern Missouri was found infested with the insect. (May 26): Cutworms, destructive to cotton following the turning of winter legumes, have become active in several counties in east-central Alabama. The larvae of this insect have destroyed several thousand acres of cotton.

Tennessee. G. M. Bentley (May 24): Serious losses are reported from many parts of the State from different species of cutworms, as well as from the armyworm. The variegated cutworm has been causing the most damage. The first recorded appearance of cutworms was on May 5. The outbreak has been the most pronounced in western Tennessee.

Mississippi. C. Lyle (May 24): On May 18 cutworms were reported by G. L. Bond, of Moss Point, as unusually abundant in his district. Crops of various kinds, as well as ornamental plants, have been severely damaged. M. L. Grimes, of Meridian, and N. D. Peets, of Brookhaven, reported considerable injury in their districts. Specimens of Prodenia ornithogalli Guen., accompanied by reports of light-to-medium damage to young cotton, were received in May from Adams, Holmes, Franklin, Lauderdale, and Marion Counties. (May 9): The variegated cutworm is causing some damage in the Delta area on cotton planted following winter legumes, but the injury is small where planting was delayed until 2 or 3 weeks after turning under the winter cover crop.

Louisiana. C. O. Eddy (May 23): Cutworms have been abundant throughout the State.

Kansas. H. R. Bryson (May 28): The pale western cutworm (Porosagrotis orthogonia Morr.) was reported to be abundant at Liberal and Gem on May 12.

- Iowa. C. J. Drake (May 27): Cutworms of various species are common in Iowa and are doing a considerable amount of damage throughout the State, particularly in gardens and truck fields. A few infestations reported in corn.
- Missouri. L. Haseman (May 23): A rather severe and general cutworm infestation has been associated with the armyworm outbreak. The greasy cutworm is predominant in some areas, though in most collections the variegated cutworm is more abundant. Garden crops, as well as field crops, have been severely damaged.
- North Dakota. J. A. Munro (May): Reports from infested areas indicate that most of the larvae of the army cutworm (Chorizagrotis auxiliaris Grote) have completed development and are in the pupal stage. A few moths have been taken recently at lights. The pale western cutworm is becoming active in the western part of the State, but no serious damage has been reported. A field in Golden Valley, examined on May 7, showed more than 25 larvae per square foot, most of them being in early instars.
- South Dakota. H. C. Severin (May 20): Cutworm damage is being prolonged and intensified by the cold, wet weather prevailing. The army cutworm is responsible for a considerable amount of the damage done.
- Kansas. J. R. Horton (May 3): First adults of the season of the army cutworm were seen on April 29 in the vicinity of Wichita. At present they are a little more in evidence, occurring in houses as well as in the field, although only scattered individuals have been seen. (May 21): Moths of the army cutworm are probably at their maximum emergence. Their numbers are larger than at any time in several years.
- H. B. Hungerford (May 23): Cutworm complaints have been numerous .
- Nebraska. M. H. Swenk (May 20): The western army cutworm was reported attacking winter wheat and alfalfa in Keith County on April 26, and a similar complaint came from Dawson County on the same date. Moths of this species have been abundant all over the State during May. The dingy cutworm (Feltia subgothica Haw.) and dusky cutworm (F. venerabilis Walk.) have been reported as injurious in eastern Nebraska gardens in May.
- Colorado. S. C. McCampbell (May 23): Army cutworms have been especially bad during the last 3 weeks in gardens in northeastern Colorado, but little injury to field crops has been reported. A few moths are flying.
- Utah. G. F. Knowlton (May 3): Reports of cutworm abundance and injury, especially to alfalfa, are received almost daily from different localities in Millard County. (May 4): Young cabbage plants in coldframes are reported as damaged by cutworms at Morgan. (May 10): Moths of the greasy cutworm are now coming to trap lights at Cedar

City, in Iron County. (May 17): Reports of cutworm injury to young sugar beets have been received from Sevier County. (May 20): A farmer at Green River reports losing half his sugar-beet stand from cutworm damage this spring. (May 23): Cutworm injury held back alfalfa growth for several weeks on many farms on Milford Flats. Damage to fall wheat was serious on a number of farms. Most of the larvae have pupated.

Nevada. G. G. Schweis (May 17): Cutworms were observed attacking various ornamental plants on May 17. They were also observed damaging fields of alfalfa at Fallon and Lovelock early in May.

Washington. K. E. Gibson (May 20): Cutworms were damaging a 4-acre field of asparagus near Walla Walla to such an extent that cutting had been practically stopped. Stalks were being cut off at the soil surface or just below, and other stalks were cut off from 2 to 3 inches above the soil. Other damage was done through chowing of the stalks until they were deformed.

BEET WEBWORM (Loxostege sticticalis L.)

Colorado. G. M. List (May 28): Moths are fairly numerous on the lawns and about the lights at Fort Collins.

Utah. G. F. Knowlton (May 23): Moths observed in alfalfa fields in southwestern Utah.

H. E. Dorst (May 28): No moths of the sugar beet webworm have been observed in sugar beet fields in central Utah despite the enormously high population in 1937.

WIREWORMS (Elateridae)

Connecticut. A. W. Morrill, Jr. (May 17): Larvae of Limonius agonus Say have been found attacking potatoes and radishes for over a month, in fairly large numbers in some fields in Hartford County. Adults have recently been found on radishes just below the ground line and on potatoes planted as test baits in fields being prepared for tobacco.

Maryland. E. N. Cory (May 4): Wireworms have been reported damaging tomatoes in Somerset County.

Florida. H. T. Fernald (May): Elaterids have been numerous at lights in Winter Park.

Louisiana. C. O. Eddy (May): Wireworms are reported to be very injurious on cotton and corn in northern Louisiana.

Iowa. H. E. Jaques (May 25): Wireworms are beginning to do serious damage to corn in southeastern Iowa.

- Kansas. H. R. Bryson (May 28): A small wireworm, Aeolus elegans F., was reported causing injury to wheat at Ashland on April 28.
- Idaho. F. H. Shirck (May 17): Several fields of onions in the locality of Parma have been damaged by L. californicus Mann. The injury began about May 10 and amounts to a thinning of stands.
- Nevada. G. G. Schweis (May 10): Wireworms were reported as damaging gardens in Reno on May 10.
- Washington. E. W. Jones (May 20): Adults of the sugar beet wireworm reached their peak of emergence at Walla Walla on May 10. The first emergence at Walla Walla of Athous pallidipennis Mann. occurred on May 9. This species was found to have transformed from overwintering larvae in April.
- Oregon. M. C. Lane and H. P. Lanchester (May 20): Extensive damage to fall, spring, and resown spring wheat was noted near Athena, in northeastern Oregon. In one field of spring wheat 84 acres were replanted, owing to complete loss of the stand through wireworm feeding. The infestation was primarily the sugar beet wireworm.
- California. M. W. Stone (May 18): Lima beans planted early in May were damaged to the extent that replanting was necessary in several fields in Orange County. Siftings made in bean rows in a field near Smeltzer on May 17 showed an average population of 1.2 and as many as 2.4 wireworms per foot. In the wireworm plots near Downey, in Los Angeles County, an average of 3.9 larvae per foot were recovered in rows of field corn, and an average of 8 larvae per foot in seed-potato rows.

WHITE GRUBS (Phyllophaga spp.)

- Vermont. H. L. Bailey (May 28): The first adult was noted at Montpelier on May 22, but beetles have been very scarce.
- Connecticut. E. P. Felt (May 24): June beetles (P. tristis F.) were reported defoliating oaks at Middlebury.
- Mississippi. C. Lyle (May 24): On May 10 a grower at Meridian, in Lauderdale County, reported considerable damage to pecan trees by P. hirticula (Knoch), P. micans (Knoch), P. crenulata Froel., and P. praetermissa Horn. The last was also reported as doing severe damage to oak trees at Houston, in Chickasaw County.
- Wisconsin. T. R. Chamberlin and assistants. (May 23): The first flight of June beetles near Madison occurred on April 25. A rather large flight was observed near Dane, in Dane County, on April 26. Flights thereafter were materially reduced until May 18, because of cold, rainy weather. A small flight was observed near Leeds in Columbia County, on May 13, with the temperature at only

48° F., the lowest temperature at which we have seen beetles emerge in any numbers. All the beetles taken belonged to the species P. fusca (Froel.). This species, together with P. tristis, has been the first to emerge in the spring during the last three seasons, probably because it flies at lower temperatures than most other species in this territory. Beginning on May 18, temperatures have been somewhat higher and the size of the flights has increased.

Minnesota. A. G. Ruggles and assistants. (May): May beetles are quite abundant in the eastern and southern sections of the State.

Iowa. H. E. Jaques (May 25): May beetles of several species are flying in extraordinary numbers on warm nights. Elms and some other forest trees are showing evidences of defoliation.

Kansas. H. R. Bryson (May 28): The wheat white grub (P. lanceolata Say) was reported on May 5 as having destroyed approximately 500,000 acres of wheat in southern and central Kansas.

Oklahoma. R. G. Dahms (May 23): Adults of P. lanceolata are very abundant in many wheatfields in southwestern Oklahoma. Although observed feeding on leaves of Sudan grass, they appear to be doing little damage.

Oregon. M. C. Lane (May 20): Numerous females of P. anxia Lec. were flying to lights on May 10 at Ontario.

JAPANESE BEETLE (Popillia japonica Newm.)

Connecticut. J. P. Johnson (May): Grubs of the Japanese beetle have been feeding on the roots of grass in New Haven, Bridgeport, Stamford, and Greenwich, causing considerable injury.

Delaware. L. A. Stearns (May 23): Severe damage to untreated lawns in New Castle County, with counts showing a grub population of from 20 to 30 per square foot.

Maryland. H. P. Boyd (May 19): Worms found under patches of dead grass in lawns at Perryville.

ORIENTAL BEETLE (Anomala orientalis Wtrh.)

Connecticut. J. P. Johnson (May): The grubs of this insect have been feeding extensively in New Haven, Bridgeport, Stamford, and Greenwich. Lawn injury has been increasingly evident.

New Jersey. E. G. Brewer (May 27): Investigation of a reported severe injury to a 5-acre lawn on an estate at Oakland, in Bergen County, disclosed extensive grub feeding by A. orientalis. Approximately $\frac{1}{4}$ acre of sod had been completely destroyed. There was a high grub population throughout the lawn. All larvae examined were of the same species.

A SCARABAEID (Ochrosidia villosa Burm.)

Connecticut. J. P. Johnson (May): Grubs of this insect have been found in increasing numbers in Norwalk and Greenwich. It is evidently spreading and building up in strength. Some winter killing of the grub stage was evident upon examination.

ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Connecticut. J. P. Johnson (May): Grubs of this insect have been feeding extensively in New Haven, Bridgeport, Stamford, and Greenwich. Lawn injury has been increasingly evident.

ROSE CHAFER (Macrodactylus subspinosus F.)

Delaware. L. A. Stearns (May 17): First adults of the season observed on young peaches in Sussex County on May 17.

Tennessee. G. M. Bentley (May 24): The rose chafer has been found at Crossville, in Cumberland County, and at Wartburg, in Morgan County, on potatoes. It is occurring in large numbers, comparable to a medium-sized swarm of bees.

WHITE-FRINGED BEETLE (Naupactus leucoloma Boh.)

Alabama. E. M. Gaddis (May 9): The white-fringed beetle was emerging the first week of May.

Mississippi. J. B. Gill (May 24): The first pupae of Naupactus sp. from insectary material were obtained on May 6. It is also interesting to note that the first pupae collected in the field were taken on this same date. Up to May 24 no adults have been found feeding on the foliage of plants in the field. However, two well-developed adults were dug out of the soil—one on May 17 and one on May 20. The larval injury to the roots and tubers of plants by Naupactus sp. is apparently quite similar to that of N. leucoloma.

FALSE CHINCH BUG (Nysius ericae Schill.)

Michigan. R. Hutson (May 26): False chinch bug has been observed at White Cloud, Muskegon, Manistee, and other points in the grass-hopper infested region of last year.

Utah. C. J. Sorenson (May 19): The false chinch bug is abundant in meadow lands and alfalfa fields near Whiterocks, in Uintah County.

H. E. Dorst (May 28): A very low population of the false chinch bug is present on range land adjacent to northern Sevier Valley, as compared to the high population in 1937.

CEREAL AND FORAGE - CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

ARMYWORM (Cirphis unipuncta Haw.)

Maine. H. B. Peirson (May 10): An unusually large number of moths flying at Bar Harbor, in southeastern Maine.

New York. N. Y. State Coll. Agr. News Letter (May 31): Moths found in large numbers nightly during the last 9 days at Ithaca and Oswego, in western New York, indicate the possibility of an outbreak. The number caught is reported to be 100 times that of average years, from 10 to 50 moths being seen at times on 1 baited tree.

Virginia. H. G. Walker and L. D. Anderson (May 25): Armyworms were very abundant and destructive in a great many alfalfa, small-grain, and cornfields in eastern Virginia during the latter part of April and the first part of May. (May 31): Moths of the second generation observed at lights near Norfolk on May 29 and 30.

Maryland. E. N. Cory (May 17): A serious outbreak reported from Somerset County on the Eastern Shore. The worms are attacking oats, barley, pasture land, and the buds of young strawberry plants.

North Carolina. C. S. Brimley (April 29): This pest is reported damaging wheat in Halifax County, in the northeastern part of the State.

Ohio. T. H. Parks (May 24): Moths are being captured commonly at Columbus, in south-central Ohio, in a light trap and in bait pans used to trap codling moths.

Indiana. J. J. Davis (May 23): Outbreaks were anticipated because of the appearance of moths in abundance in many parts of the State some 5 or 6 weeks ago. We received a report on May 11 of a general outbreak in Martin County, in the south end of the State. No further reports have been received.

L. F. Steiner (May 9): An outbreak is occurring adjacent to one local orchard in Vincennes, in southwestern Indiana.

Illinois. W. P. Flint (May 23): As expected, armyworms have been hatching in the southern and south-central parts of the State during the last 2 weeks and are now hatching in numbers in the central part.. The injury has been complicated by the fact that the variegated cutworm (Lycophotia margaritosa saucia Hbn.) and the true armyworm are present in about equal numbers and the rank growth of clover in many fields has prevented successful control of the former. Very few parasites have been present.

Kentucky. W. A. Price (May 28): Spring armyworms appeared in scattered sections over the central and western parts of the State.

Tennessee. G. M. Bentley (May 24): There have been serious losses in many parts of the State from the armyworm.

Missouri. L. Haseman (May 23): During the first half of the month a severe outbreak of armyworms was reported from the Arkansas line almost to the Missouri River, especially throughout most of the southeastern counties. On some farms the infestation was more severe than a year ago, with fields of wheat, pastures, and meadows practically stripped. Heavy baiting in that area has been carried on. Since May 15 in central and northern Missouri the worms have reached the stage of development where they have been attracting considerable attention, although, from the Missouri River to Iowa, the infestation is much less severe than a year ago except on scattered farms. At Columbia most of the armyworms are approximately half grown, with occasionally a very small caterpillar and an almost full-grown specimen. Development is much more uneven than a year ago and in northern Missouri it now appears that the injury will be far less than in 1937.

Oklahoma. F. A. Fenton (May 20): The infestation in Oklahoma parallels last year's outbreak in intensity. Certain areas report much greater damage than last year, while the reverse is true in others. Actual damage to wheat this year is believed to be greater than last year because the armyworms were forced to feed on the heads at an earlier date because rust has destroyed most of the leaves.

Utah. G. F. Knowlton (May 25): Moths were coming in numbers to the trap light at Cedar City on May 10.

CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton (May 23): Spring flight from hibernation to small grain near La Fayette was practically completed by May 1, most of it taking place during the last 10 days in April. The cold wet weather last month has been unfavorable for chinch bug development, although considerable mating and other activity has been observed on warm days. General infestation of winter wheat and rye in this locality has been light; but, as the bugs are now deserting the ranker wheat and concentrating in the thinner stands, occasional concentrations can be found that will produce moderately severe infestations if weather conditions are favorable. Some eggs and a few-first-instar nymphs, the first observed this season, were seen in spring barley near La Fayette on May 21.

Illinois. W. P. Flint (May 23): Chinch bugs were present in small grain, particularly barley, thin wheat, and oats. The infestation, while scattered, is very severe in some of the southern, south-central, and central areas. For the last 10 days frequent rains have considerably reduced the numbers of adult bugs, and will certainly lessen the damage.

Iowa. C. J. Drake (May 27): Chinch bugs occur in threatening numbers in the two southern tiers of counties in Iowa and are found occasionally in the third tier. The infestation is spotted and is, perhaps, comparable to the infestation in the spring of 1934. Unless weather holds the insects in check, many fields of small grain will be badly injured.

Missouri. L. Haseman (May 23): Only in scattered areas of the State are the farmers reporting any concern about chinch bugs. Excessive rainfall, which has covered most of the State this month, has tended to check chinch bug spread and development.

Kansas. H. R. Bryson (May 28): Chinch bugs are quite scarce in most sections, but are abundant in barley fields in eastern Kansas. This may or may not be an indication of actual population. Young bugs appeared in southern Kansas before the middle of May.

Oklahoma. F. A. Fenton (May 20): Chinch bugs reported at following localities in the central part of the State: Britton, in Oklahoma County; Stroud, in Lincoln County; and Bristow, in Creek County.

R. G. Dahms (May 23): Infestation seems to be very spotted in southwestern Oklahoma. Bugs are especially abundant in spring barley. The first nymphs were found on May 5. Eggs have hatched very rapidly during the last week, and there are many nymphs in the first and second instars, and a few in the third. The overwintered adults are still laying eggs.

MEADOW PLANT BUG (Miris dolabratus L.)

Indiana. J. J. Davis (May 23): Meadow plant bug reported attacking wheat more or less generally in Rush County, in central Indiana, on May 13; and, from general reports, it is apparently rather prevalent in other areas. Reported from Huntington County on May 23.

GREEN BUG (Toxoptera graminum Rond.)

Oklahoma. F. A. Fenton (May 20): Green bug in wheat reported from Willow, in southwestern Oklahoma, and in oats from Coyle, in the south-central part.

APHIDS (Aphididae)

Kansas. J. R. Horton (May 3): Aphids (spring grain aphid?) have been slowly increasing in wheat in the vicinity of Wichita for about a month. They are now numerous enough to be noticed on casual inspection of wheat. Perhaps 100 percent of plants in lowland situations harbor one or more small groups of individuals. Winged forms are still very scarce.

A LEAF BUG (Labops hirtus Knight)

Montana. H. B. Mills (May 26): This little leaf bug is rather abundant in Big Horn and Carbon Counties, in south-central Montana. On one ranch southeast of Hardin, it is doing serious damage to a small area of winter wheat and a large area of range land.

HESSIAN FLY (Phytophaga destructor Say)

Indiana. W. B. Cartwright and C. Benton (May 23): Most of the spring brood of hessian fly emerged during the latter half of April in the vicinity of La Fayette. Most of the egg laying occurred between April 20 and May 1. A few eggs were still found on May 7 during the regular weekly examination. Several full-grown larvae were found on April 29 and first puparia on May 7. By May 14 about 20 percent of the larvae had pupated and 87 percent on May 20. With unusual early development of the flies it appears that some supplementary brood may result if weather conditions continue favorable. On May 20 examination of 100 puparia from near Delphi showed 3 percent pupated. Examination of a number of winter wheat-fields in Benton and Tippecanoe Counties, in west-central Indiana, shows considerable fly infestation by the spring brood, even in those fields seeded last fall after the safe date. The cool wet spring has been favorable for a rather general build-up of fly infestation. In a number of fields the infestation is severe enough to reduce the yield materially.

Michigan. R. Hutson (May 26): A field of wheat containing approximately 20-percent infestation of hessian fly was found at Hillsdale, in southern Michigan. Other fields in the vicinity were less heavily infested.

EUROPEAN WHEAT STEM SAWFLY (Cephus pygmaeus L.)

Pennsylvania. E. J. Udine (May 21): On this date the adults were numerous in wheatfields at Carlisle, in the south-central part of the State.

STRAW WORM (Harmolita grandis Riley)

Indiana. C. Benton (May 23): About 5-percent infestation observed in several winter wheatfields in Benton and Tippecanoe Counties. Infested plants examined from May 15 to 20 showed pupae in galls, both honey-yellow and black-colored. A few adults were active in the fields.

JOINT WORM (Harmolita tritici Fitch)

Indiana. C. Benton (May 20): One field of winter wheat near La Fayette showed a slight infestation (estimated about 1 percent). The infested stalks were starting to head, most of them were beaten to the ground, and showed the characteristically swollen stems.

CLOVER MITE (Bryobia praetiosa Koch)

Oklahoma. R. G. Dahms (May 23): The brown wheat mite (probably B. pratensis) did serious damage to wheat in southwestern Oklahoma during the last week of April and the first 10 days of May.

CORN

CORN EARWORM (Heliothis obsoleta F.)

New Jersey. J. B. Schmitt (May 24): The first moths were found in the vicinity of New Brunswick, in northeastern New Jersey, on May 13.

South Carolina. J. G. Watts (May 5-25): Corn earworms were observed at Blackville, in the southwestern part of the State, feeding on corn prior to tasseling and on the ears in the milk stage.

Georgia. T. L. Bissell (May 31): Five moths caught in light traps on May 30. This is a considerable increase, indicating emergence of first-generation moths. Worms are already damaging tomatoes here at Experiment, in central Georgia, and at Clarkston in De Kalb County, northwestern Georgia. They are feeding in small fruits and on leaves.

Mississippi. G. L. Bond (May 24): Severe damage to both corn and tomatoes was recently observed at Moss Point, in southern Mississippi.

Louisiana. C. O. Eddy (May): Tomato fruitworms are active on corn and tomatoes in the State.

Texas. R. W. Moreland (May 28): Injury to buds of corn has been light in Brazos and Burleson Counties. Corn has begun to silk and on 100 plants examined 58 eggs were found on 4 silks. The first eggs were found on cotton on May 23 at College Station.

California. J. Wilcox (May 2): About 20 percent of the tassels in this early sweet corn field at Olive, in southern California, were damaged. Eggs and small larvae were numerous and a few mature larvae were found. On May 10 examination was made in the same field and 50 percent of the ears were found infested with from one to four larvae each. Most of the larvae were in the first, second, and third instars and a few larger worms were found.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Massachusetts. A. I. Bourne (May 24): We have found that pupation of the European corn borer began the first week of May in Hampden County, in the lower Connecticut Valley, and moths were emerging by May 15 or 16. In the upper Connecticut Valley counties and in Worcester County, in the central part of the State, development was about 10 to 14 days later, but our observations have shown a great variation in the development according to the location of the

larvae. In corn that remained in the stacks, or was stored in sheds and has not yet been disposed of, we found that very little pupation has taken place, whereas in unplowed fields or where corn refuse has been allowed to remain on the top of the soil practically all the larvae have pupated. It is expected that this will interfere considerably with the program of insecticide treatment for corn borer in early sweet corn, which many growers are planning to undertake this season, as it is certain that moth emergence and appearance of the larvae will be extended over a much longer period than usual, owing to this unevenness of pupation.

Connecticut. M. P. Zappe (May 21): Many overwintering larvae are now in the pupal stage. A few adults have emerged from cornstalks and stubble on light sandy soil.

New York. L. A. Carruth (May 18): Examinations of corn stubble in Nassau County, on Long Island, during the first half of May indicate an average survival of approximately 25 borers per 100 stubbles, although in some fields the survival was considerably higher. At the present time approximately 80 percent of the larvae that survived the winter in corn stubble have transformed into pupae. Very little moth emergence has been observed. Approximately 40 percent of the larvae which survived the winter in cornstalks in barnyards in Nassau County have transformed to pupae.

New Jersey. C. A. Clark (May 20): Spring pupation of the borer advanced very rapidly during the latter part of April and early in May. Moths started to emerge early in May and counts indicated from 16- to 42-percent emergence in Monmouth and Burlington Counties by May 19. Egg deposition has been delayed by low temperatures at night.

J. B. Schmitt (May 24): Emergence of the European corn borer is about 60 percent in southern New Jersey and about 15 percent in the northern part of the State.

ALFALFA

PEA APHID (Illinoia pisi Kltb.)

New Jersey. J. B. Schmitt (May 24): Outbreaks in New Jersey are serious in dairying sections, and wherever alfalfa is grown, and are accompanied by pea mosaic. In areas away from alfalfa the aphid is not a serious problem.

Illinois. W. P. Flint (May 23): Pea aphids have been building up in large numbers in red clover, sweetclover, and alfalfa fields. The infestation in peas has occurred and reproduction has been taking place for more than a week.

Colorado. S. C. McCampbell (May 23): This aphid has been especially abundant in the Canon City district of Fremont County, just southeast

of the Pikes Peak area. We have also had a few reports from the western slope of Colorado, in Delta County. Ladybird beetles and syrphid fly larvae are abundant and are expected to control this outbreak soon.

Idaho. R. W. Haegele (May 19): Heavy infestations of pea aphid are common in alfalfa fields throughout southwestern Idaho, where serious damage is occurring in many fields.

Utah. G. F. Knowlton (May 13): Pea aphids are abundant on alfalfa and are becoming established on peas in the Salt Lake City area. They are somewhat less abundant in northern Utah. In Beaver County, in southwestern Utah, 40 acres of alfalfa are reported as destroyed and 100 acres more as severely damaged. (May 27): Pea aphids have reduced the first crop of alfalfa by approximately 50 percent in Davis County (according to the County Agent's estimate). Damage in Salt Lake and Utah Counties, especially on the bench lands, has been nearly as severe. Damage is serious in several alfalfa fields at Salina, in central Utah.

Nevada. G. G. Schweis (May 19): Alfalfa aphids were reported as severely damaging alfalfa in western Nevada on May 19.

Oregon. M. M. Reeher and L. P. Rockwood (May 21): Some fields of early fall sown vetches and Austrian winter field peas were seriously damaged throughout the Willamette Valley, in northwestern Oregon, late in April and early in May. By May 12 aphids were checked severely and almost eliminated by a fungous disease. Deficient precipitation since May 12, with very low night humidities on May 13 and 14, has checked the spread of these diseases, especially on Austrian peas, and aphids have increased rapidly. Syrphid eggs and larvae are becoming abundant. Some fields seeded about November 1 do not yet show damaging populations.

California. A. E. Michelbacher (May 20): The pea aphid has been rather abundant on alfalfa during the entire growing season. It was particularly bad in the San Joaquin Valley. A brief review of what occurred follows: If the pea aphid is serious it is usually the first crop of alfalfa that is injured. This year, although there was a large population on the first cutting, it was the second crop that was most seriously injured. In certain fields the population was large enough to deform much of the alfalfa. In many fields the population built up to a point where one had to stop sweeping after taking 50 strokes, because the net became so heavy with aphids. This was the condition up to May 10. At that time, in many fields, predators and a fungus disease began to get the upper hand. In the survey made on May 19 hardly an aphid was encountered.

THREE-CORNERED ALFALFA HOPPER (Stictocephala festina Say)

Louisiana. L. O. Ellisor (May): First-generation nymphs of the three-cornered alfalfa hopper are damaging alfalfa in the southern part of the State.

ALFALFA WEEVIL (Hypera postica Gyll.)

Utah. C. J. Sorenson (May 19): This pest is doing serious injury in some fields in Utah County, in northern Utah.

G. F. Knowlton (May 23): Larvae are beginning to injure alfalfa at Kanosh, in Millard County, and are damaging alfalfa foliage in one field at Minersville, in Beaver County, both in western Utah.

Nevada. G. G. Schweis (May 13): A survey of fields in Douglas County, in western Nevada, on May 13 showed no larvae of the alfalfa weevil present, although the stems contained many eggs. This is unusual, as ordinarily by May 15 the larvae are very numerous on the plants.

California. A. E. Michelbacher (May 20): The alfalfa weevil is becoming rather scarce over the entire infested region of low land in central California. A survey of the infested area shows an average number of individuals collected per 100 sweeps of an insect net in the different fields according to the following range: San Joaquin Valley, adults 0-18⁴, larvae 0-120; Pitasanta area, adults 0-1, larvae 0-12; San Francisco Bay area, adults 0-3, larvae 4-55. Most of the large alfalfa weevil larvae collected were parasitized by Bathyplectes. Based on rearing records, the amount of parasitization over the entire infested area for different fields on May 2 ranged from 95 to nearly 100 percent.

ALFALFA CATERPILLAR (Eurymus eurytheme Bdv.)

Tennessee. G. M. Bentley (May 24): Reported as found on alfalfa in the northern portion of Lake County, in northwestern Tennessee, where it had completely stripped the alfalfa of its leaves.

CLOVER

CLOVER LEAF WEEVIL (Hypera punctata F.)

Maryland. E. N. Cory (April 29-May 6): There is a general infestation, but reports of extreme damage coming from Cecil, Harford, (northeastern counties) and Howard County, in the central part of the State.

Virginia. P. F. Skofield (May 11): Beetles received from Hampton Institute, in southeastern Virginia.

Mississippi. C. Lyle (May 24): Adults were received from Mayersville, in Issaquena County, on April 23, with the report that they were abundant around a few alfalfa plants. Other specimens also probably found on alfalfa were received from Schlater in Leflore County on May 3, both counties being in western Mississippi.

Kansas. H. R. Bryson (May 28): Reported as abundant in a lawn at La-Crosse, in central Kansas, on May 21, but not doing damage when observed.

CLOVER ROOT BORER (Hylastinus obscurus Marsh.)

Idaho. J. R. Douglass (May 10): A complaint has been received of this insect infesting clover plants northeast of Jerome, in south-central Idaho.

COWPEAS AND SOYBEANS

CURCULIOS (Chalcodermus spp.)

South Carolina. J. G. Watts (April and May): Scattering specimens of C. aeneus Boh. have been found on cotton and cowpeas at Blackville, in southwestern South Carolina. No indications of destructive numbers.

Georgia. T. L. Bissell (May 19): Adults of C. collaris Horn are infesting potted cowpeas set in the field at Experiment, in central Georgia. First insects seen April 26, a week earlier than noted in 1936 or 1937.

CLOVER STEM BORER (Languria mozardi Latr.)

Louisiana. L. O. Ellisor (May): From 25 to 35 percent of early planted soybeans at Baton Rouge, in south-central Louisiana, contain larvae.

GRASS

MEADOW PLANT BUG (Miris dolabratus L.)

Kentucky. W. A. Price (May 28): This pest appeared in unusual numbers in bluegrass fields in Fayette, Clark, and Bourbon Counties, in central Kentucky.

A PYRALID (Nomophila sp.)

Kansas. H. R. Bryson (May 28): This small grass worm was reported on April 26 as having destroyed 40 acres of fine bluegrass and wild-oat pastures at Williamsburg, in east-central Kansas.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

Louisiana. J. W. Ingram, W. E. Haley, and L. J. Charpentier (May 25): Injury from first-generation borers has been heavier than in a number of years. Borers of this generation are pupating and some moths have emerged.

B. A. Osterberger (May 23): Infestations are scattered. Very heavy in February-planted corn in some fields. Parasites (Trichogramma spp.) very scarce. Second-generation adults began emerging about the middle of May. Eggs are scarce.

SUGARCANE BEETLE (Euctheola rugiceps Lec.)

North Carolina. C. S. Brimley (May 31): Boring into bottoms of stalks on a farm at Sherill's Ford, in the western part of the State.

Kentucky. W. A. Price (May 28): Rough-headed cornstalk beetles did some damage to corn in the vicinity of Morgantown, in northwestern Kentucky.

Mississippi. C. Lyle (May 24): Injury to young corn and sugarcane by this insect has been reported from localities scattered over the State.

Louisiana. W. A. Douglas (May 19): Injury to young rice stalks averaged 2.8 percent for the 1938 season. A total of 8,500 stalks were examined in 17 fields and the highest percentage of injury in any 1 field was 39.6.

B. A. Osterberger (May): These insects are not so active as they were several weeks ago. Much cane has apparently overcome noticeable signs of injury. Eggs and young stages are found by digging in the soil. Few adults are attracted to lights around Baton Rouge.

FRUIT INSECTS

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

- Massachusetts. E. P. Felt (May 24): A flatheaded borer (probably C. femorata) was found to be somewhat prevalent in beech at Hopkinton, in eastern Massachusetts.
- Indiana. J. J. Davis (May 23): Flatheaded borer reported attacking apple and maples, both hard and red, from all sections of the State.
- Illinois. W. P. Flint (May 23): Reports of damage have been generally very numerous. Damage to fruit and shade trees has been heavy.
- Kansas. H. B. Hungerford (May 23): Borers, both roundheaded (Saperda candida F.) and flatheaded, continue to be unusually abundant, and many shade trees, damaged by heat, drought, and previous defoliation by cankerworms, are dying from attack by the borers.
- Nebraska. M. H. Swenk (May 20): Complaints of damage by the flatheaded apple tree borer were received during the period April 22 to May 7 from Douglas, Merrick, and Antelope Counties, in eastern Nebraska, and from Dundy County, in southwestern Nebraska. Trees concerned were chiefly American elm, green ash, and soft maple.
- Oklahoma. F. A. Fenton (May 20): The roundheaded apple tree borer was reported on apple trees at Red Oak, in southeastern Oklahoma.

FRUIT TREE LEAF ROLLER (Cacoecia argyrospila Walk.)

- Missouri. L. Haseman (May 23): During May the heaviest outbreak in 30 years developed. Worms began pupating the middle of the month and moths have been emerging in the laboratory at Columbia since May 20. Most of the larvae have pupated, though here and there, larvae still only half-grown may be found. This year they have been attacking the foliage of a very wide range of trees and shrubs, with an occasional specimen found on herbaceous plants.

THRIPS (Thysanoptera)

- Indiana. J. J. Davis (May 23): Thrips (immature forms seen, apparently Thrips tabaci Lind.) were common on sweet cherry leaves at Kendallville, in northeastern Indiana, on May 16. They were feeding chiefly at the base of the crotch of the main veins along the midvein. The feeding had killed little areas, which turned brown and dropped out; however, the injury was not considered serious.
- Pennsylvania. H. E. Hodgkiss (May 25): Thrips on apple leaves are generally abundant and some are apparently curling tender foliage.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

- Massachusetts. A. I. Bourne (May 24): Red mite followed very closely the bud development and appeared at the usual time in relation to bud development

and leaf growth of apples, although this was considerably earlier than the normal calendar date of their appearance.

Connecticut. P. Garman (May 20): Pest appearing in considerable numbers in several large apple orchards throughout the State.

Oregon. D. C. Mote (May): European red mites heavier than usual on prunes.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (May 25): Adults were first captured at Poughkeeps in bait traps on May 17. Weather conditions were generally unfavorable for activity and few female moths were captured before May 21. Moths began emerging from pupae in overwintering cages on May 18.

N. Y. State Coll. Agr. News Letter (May): Moth emergence was first noted at Geneva on May 18.

Pennsylvania. H. E. Hodgkiss (May 25): First catches of adults in bait pails in the following counties in southeastern Pennsylvania: Cumberland, on May 3; Adams, on May 4; Delaware, on May 6; and Franklin, on May 9. Emergence was slow, owing to low temperatures until May 17 in Delaware County. In Adams County there was a heavy catch on May 17, 18, and 19.

Delaware. L. A. Stearns (May 26): Approximately 100 percent of the overwintered larvae had pupated on May 12; the peak of emergence of spring-brood moths was on May 7 and 8; maximum catch by bait cans was on May 17; and first injury by first-brood larvae was observed on May 17, about 2 weeks earlier than usual.

Maryland. E. N. Cory (May 8): First peak of emergence, following a week of high temperatures in Washington County, in western Maryland.

Virginia. W. J. Schoene (May 23): The peak of codling moth emergence was noted on May 2 to 6 at Stuart, and on May 4 to 9 at Roanoke, both in southwestern Virginia.

A. M. Woodside (May 15): Moth emergence began at Staunton in west-central Virginia, on April 29. An apparent peak in emergence was reached on May 6 and 7, after which cool weather checked emergence. The number of moths emerging has increased rapidly and is now at an apparently true maximum. Eggs began to hatch on May 15. Oviposition light.

Georgia. C. H. Alden (May 20): First-brood larvae are beginning to leave the fruit at Cornelia, in northeastern Georgia, but only about 2 percent of the apples are stung or wormy. A few spring-brood moths are still coming to the bait-pots.

Ohio. T. H. Parks (May 23): Mortality of larvae was very light during the last winter. Emergence of moths began in southern Ohio on April 27,

at Columbus on May 3, at Wooster on May 4, and near Toledo on May 16. Eggs are now common on apples at Columbus, but no larval entrances have been observed. Heavy frosts on May 12 and 13, with temperatures as low as 23° F. in a few orchards, slowed up incubation but it remains to be seen whether eggs were killed.

Indiana. L. F. Steiner (May 11): Emergence and bait-trap captures have fallen off somewhat during the last week, but the moth population in unbaited trees was about 10 percent greater than a week ago, the average at Bicknell being 15 moths. The first hatched eggs were found on May 6, 2 weeks earlier than normal. (May 19): From May 10 to 17 development had been practically at a standstill so that conditions now are only about 1 week ahead of normal. (May 24): Moth activity in southwestern Indiana reached a peak on May 3 and another of about equal size on May 19 and 20. Successful entrances in unsprayed orchards are difficult to find. Counts on May 18 showed that 92 percent of the overwintering brood had pupated and 85 percent emerged.

Illinois. W. P. Flint (May 23): Emergence from overwintering larvae has been unusually heavy, owing to the high rate of survival. As cool, wet weather has delayed or prevented egg laying, infestation in unsprayed orchards at the present time is light.

Missouri. L. Haseman (May 23): Moths began to emerge 10 to 14 days earlier than normal. In southern Missouri bait traps showed moths on the wing late in April, the emergence in that part of the State increasing in abundance until around May 3 or 4. In northwestern Missouri emergence began around May 3, increasing in abundance through May 10 and 11. In northeastern Missouri emergence in breeding cages began late in April but only an occasional moth appeared in the bait jars until May 15 and 16. In southern Missouri worms first began entering fruit about the middle of May and a week later they were observed in central and northern Missouri. While there was a considerable carry-over of the pest from last year, they have found the weather in May very unfavorable for normal breeding.

Missouri and Kansas. H. Baker (May 21): Moths began emerging in northeastern Kansas and northwestern Missouri in outdoor cages on April 29 and were first taken in bait traps on April 30. This is the earliest record of emergence for several years. Almost continuous cool, rainy weather since the first emergence has retarded development although moths have been captured in bait traps in large numbers whenever conditions have been at all favorable for their activity. No signs of larval activity have been observed by the writer, but on May 18 another observer in central Missouri found entrances, some of which appeared to be 2 or 3 days old.

Kansas. H. R. Bryson (May 28): Emergence of adults did not take place until the middle of May. The last week in May many worm entrances have occurred where control measures have not been properly taken.

Colorado. G. M. List (May 28): The first codling moth of the season emerged on May 4 at Fort Collins, in north-central Colorado. There has been very low winter mortality in this section.

J. H. Newton (May 23): The first moth was caught at Paonia, in west-central Colorado, on May 14.

Idaho. R. W. Haegeler (May): Codling moth control this season promises to be more difficult than usual, owing to the survival of large numbers of worms after a mild winter and also to a light crop.

Washington. E. J. Newcomer (May 19): The first moth was found in baits at Yakima, in south-central Washington, on April 25, and the first eggs were laid in field cages on April 30.

EASTERN TENT CATERPILLAR (*Malacosoma americana* F.)

Maine. H. B. Peirson (May 12 and 15): First nests appeared at Bar Harbor on May 12. By May 15 the pest was very abundant in Augusta and vicinity.

F. H. Lathrop (May 17): An egg mass was observed hatching at Orono in Penobscot County, in central Maine, on April 20. Small, newly formed nests were observed on apple trees at Monmouth, in Kennebec County, in the southwestern part of the State, on April 25. The nests appear to be somewhat more abundant than last year.

Vermont. H. L. Bailey (May 28): Infestation of the eastern tent caterpillar is somewhat spotty, but heavy in many parts of the State. The feeding period is nearly ended, and the larvae are leaving trees to spin cocoons.

Connecticut. W. E. Britton (May 21): Scarce around New Haven, but more prevalent in Litchfield County, in northwestern Connecticut. More nests reported in Tolland County, to the east, than elsewhere. Nests reported very abundant at Rainbow in Hartford County, in the northern part of the State.

New York. J. V. Schaffner, Jr. (May 23): Caterpillars are causing considerable concern in Broome and Delaware Counties, in south-central New York. The wild cherry and apple trees along fences and rural highways are heavily infested.

Maryland. E. N. Cory and staff (May 24): Heavy infestation on apple, cherry, and other trees in Dorchester and Somerset Counties on the Eastern Shore.

Georgia. T. L. Bissell (May 9): First moths caught in light trap at Experiment, in central Georgia, on April 30.

GREEN FRUITWORM (*Graptolitha antennata* Walk.)

New York. N. Y. State Coll. Agr. News Letter (May): The green fruitworm is injuring apple to ~~some~~ extent in the Hudson River Valley.

Indiana. L. F. Steiner (May 24): This pest has been more abundant at Vincennes than at any time in the last 5 years, and its damage is conspicuous in some orchards.

PISTOL CASEBEARER (Coleophora malivorella Riley)

Maine. F. H. Lathrop (May 17): Small casebearers, recently emerged from hibernation, were observed attacking developing apple buds on May 3 at Monmouth, in Kennebec County.

Pennsylvania. H. E. Hodgkiss (May 25): Damage very severe in two apple orchards in Adams County, in southern Pennsylvania.

Virginia. W. J. Schoeno (May 23): Reports from Winchester, in northern Virginia, that the pistol casebearer is more abundant than for several years.

APHIDS (Aphidae)

Maine. F. H. Lathrop (May 17): Newly hatched nymphs of the apple aphid (Aphis pomi Deg.) were found on apple buds on April 25 at Monmouth, in Kennebec County. This is about 1 week ahead of hatching last year. Stem mothers began producing young on May 15, only a day or two earlier than last year.

Massachusetts. A. I. Bourne (May 24): Winged migrants of the apple grain aphid (Rhopalosiphum prunifoliae Fitch) being found at present, the first of these noted before May 13.

Connecticut. P. Garman (May 20): Rosy aphids (Anuraphis roseus Baker) present in most apple orchards in New Haven County, becoming abundant in a few. Early season dry periods have not permitted extensive development in most orchards.

New York. N. Y. State Coll. Agr. News Letter (May): The fruit aphids are causing only a moderate amount of damage generally over the State.

Pennsylvania. H. E. Hodgkiss (May 25): Rosy apple aphids are abundant in some orchards, curling leaves and infesting fruit clusters.

New Jersey. T. L. Guyton (June 1): Very numerous on unsprayed host trees near Bound Brook, in north-central New Jersey.

Delaware. L. A. Stearns (May 16): General infestation of the rosy apple aphid, which is severe, especially in orchards where control measures have been omitted.

Maryland. E. N. Cory (May 13): Two lots of rosy apple aphids sent in, one from Cambridge and one from Baltimore, both accompanied by numbers of larvae of the ladybird beetle and the syrphus fly. Woolly aphids (Eriosoma lanigerum Hausm.) reported generally on apples.

Virginia. A. M. Woodside (May 21): Two weeks ago predators of the rosy apple aphid seemed to have the situation well in hand, but most of these have pupated and the aphids are multiplying rapidly. Damage in some orchards will be from light to moderate.

H. G. Walker and L. D. Anderson (May 25): Aphids were very abundant during the latter part of April and the first part of May on a few apple trees growing on the grounds of the Virginia Truck Experiment Station at Norfolk.

Georgia. C. H. Alden (May 20): Green apple aphids are abundant in most apple orchards in the State.

Mississippi. C. Lyle (May 24): Injury to oats by the apple grain aphid was reported on May 7 from Glendora, in Tallahatchie County, in northwestern Mississippi.

Indiana. J. J. Davis. (May 23): The rosy apple aphid has been very abundant on and destructive to apple, especially in the southern half of the State. The natural enemies are just now beginning to make some headway against them.

L. F. Steiner (May 9): Rosy apple aphids are conspicuous on many trees. Migration and natural enemies have greatly depleted the aphid population on apple trees. (May 11): Rosy and green aphids are still very abundant in western Indiana, with the former predominant and still causing severe injury. The effect on the fruit is already very noticeable. Natural enemies are increasing very slowly. The woolly apple aphid has been very active on twigs injured by the 13-year locust last season. (May 24): The damage done by rosy apple aphids is the most severe that has been observed in southwestern Indiana for several years.

Missouri. L. Haseman (May 23): During May orchards have been more severely infested by the rosy apple aphid than for many years. At Columbia the peak of development of the pest came around May 10 to 15, but they are still abundant. Notwithstanding the cool, rainy weather, predators and, to a less extent, parasites have been helping to reduce the infestation.

Washington. E. J. Newcomer (May 6): The green apple aphids are more numerous than usual at Yakima. Ladybird beetles, mostly Coccinella quinque-notata Kby., are also very numerous and 18 egg clusters were observed on 1 limb.

WHITE APPLE LEAFHOPPER (Typhlocyba pomaria McAtee)

Connecticut. P. Garman (May 20): Either late in appearing or less abundant than usual in New Haven County.

New York. N. Y. State Coll. Agr. News Letter (May): The first nymph was observed in the lower Hudson River Valley on April 29. The first week in May the insect was hatching generally from overwintered eggs and by May 9 the larger nymphs were beginning to acquire wings.

Pennsylvania. H. E. Hodgkiss (May 25): White apple leafhopper hatching rapidly. During the week of May 15, these were plentiful up to and including 3d-instar individuals.

Virginia. A. M. Woodside (May 21): Nymphs are common in some orchards around Staunton and adults are beginning to appear.

NEW YORK WEEVIL (Ithycerus noveboracensis Forst.)

Massachusetts. A. I. Bourne (May 24): A rather severe infestation was reported within the last few days. The insect has shown itself to be very abundant and is causing considerable damage in a young apple orchard adjoining a strip of woodland. Injury caused by this beetle last year was not extensive. This year, however, the insects are very abundant and have already caused considerable damage to young growth. This is interesting, as this insect is seldom abundant enough to cause appreciable damage.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Maine. F. H. Lathrop (May 17): A very few individuals have emerged in experimental emergence cages. A period of cold rains during the last 2 weeks has delayed emergence around Monmouth, in Kennebec County.

Massachusetts. A. I. Bourne (May 24): Plum curculio has been considerably delayed in coming out of hibernation and appearing in the orchards because of the slightly cool weather this last week or 10 days.

Connecticut. P. Garman (May 20): No damage yet seen from this insect in New Haven County. Stage of tree development appears to be much further advanced than that of the insect.

New York. N. Y. State Coll. Agr. News Letter (May): Plum curculios began emerging in the lower Hudson River Valley during the first week in May and by the middle of the month were reported as abundant in several orchards.

Pennsylvania. H. E. Hodgkiss (May 25): Unsprayed peach orchards show approximately 75 percent of the fruits cut by plum curculio. Adults are plentiful, feeding and laying eggs. No hatching of eggs observed.

Delaware. L. A. Stearns (May 26): Peak of activity of overwintered adults as determined by jarring in Sussex County, in southern Delaware, on May 12. Peach drops now generally infested with mature, first-brood grubs. Partial second brood seems certain if the present favorable weather conditions continue.

Virginia. W. J. Schoene (May 23): Plum curculio adults are still depositing large numbers of eggs in the peach orchards in Albemarle County, in north-central Virginia, and many of the larvae are leaving the fruit.

A. M. Woodside (May 21): Overwintered adults of the plum curculio were more abundant in peach orchards of the Crozet section, in Albemarle County, this spring than since 1930. Larvae began to leave dropped fruit on May 7. Most infested fruits in orchards that were sprayed and jarred had dropped by May 15. Adults in the insectary are still depositing large numbers of eggs.

Georgia. O. I. Snapp (May 14): At Fort Valley, in central Georgia, 3,375 larvae were reared from 1 bushel of peach drops collected on April 13. This represents an infestation of about 42 percent, which is the maximum infestation. The average infestation will be considerably lighter than this. (May 20): The first plum curculio pupation of the season was recorded at Fort Valley on May 6, which is exactly 3 weeks earlier than the first pupation last year. Pupae of the first generation had transformed to adults in the soil by May 20, but there had been no emergence of new beetles by that date. Cage and jarring records revealed the fact that most of the overwintered adults had died by May 18. The curculio infestation at Fort Valley is now lighter than that of an average year, which is doubtless due to the lighter than usual carry-over from last year, perhaps the lightest in 18 years.

C. H. Alden (May 20): The grub infestation was so light in the northern section of the State that many of the growers did not pick up drops. The peaches in the orchards to date remain practically free of worms.

Mississippi. C. Lyle (May 24): Considerable injury on unsprayed peach trees is reported by J. Milton, of Jackson; M. L. Grimes, of Meridian; and N. D. Poets of Brookhaven, in the eastern and southern parts of the State.

Louisiana. W. F. Turner (May 16): Curculios were found to be present in considerable numbers in Bossier Parish, in northwestern Louisiana, on May 10, when jarring was tried.

Arkansas. W. F. Turner (May 16): Discussion with various growers in the Nashville area, which includes parts of Howard and Pike Counties, in southwestern Arkansas, brought out the fact that in some orchards there is a much heavier infestation than has occurred in the area since 1929. Orchards that have received uniformly efficient control measures during the last several years are very lightly infested and the infestations are confined to the areas near possible hibernation quarters.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Delaware. L. A. Stearns (May 26): Approximately 100 percent of overwintered larvae pupated by April 25; peak of emergence of spring-brood moths on April 20 and 21; first twig injury by first-brood larvae observed on May 4 and at its height by May 20.

Virginia. A. M. Woodside (May 21): Emergence of the spring brood of oriental fruit moths is complete in the Staunton district. Twig infestation is high, although premature hardening of twigs has caused many of the worms to enter fruit. No first-brood moths have been observed.

Georgia. O. I. Snapp (May 14): Moths of the first full generation of 1938 at Fort Valley are now emerging. The infestation is light, or about as usual at this season of the year.

C. H. Alden (May 20): More abundant than last year near Cornelia and several orchards, especially where there are plantings of young trees, are showing considerable twig injury.

Tennessee. G. M. Bentley (May 24): Oriental fruit moth reported infesting peaches very heavily at McMinnville, in Warren County, in central Tennessee.

Mississippi. C. Lyle (May 24): Peach twigs injured by the oriental fruit moth were received from Hazlehurst, in Copiah County, in southwestern Mississippi, on May 16.

Indiana. L. F. Steiner (May 19): Twig damage is less than normal at this stage of development in southwestern Indiana.

Illinois. W. P. Flint (May 23): This insect has appeared in rather large numbers in many localities in southern Illinois. The second brood is just coming on.

PEACH TWIG BORER (Anarsia lineatella Zell.)

Colorado. J. H. Newton (May 10): Overwintering brood of larvae nearly mature and causing injury to new growth and fruit in apricot orchard near Paonia in the west-central part of the State.

PEACH BORER (Conopia exitiosa Say)

Connecticut. P. Garman (May 20): Severe infestations seen in several peach orchards in New Haven County, causing more damage than usual.

Virginia. A. M. Woodside (May 21): Peach borers seem to be unusually abundant in the Staunton district.

Georgia. O. I. Snapp (May 19): Peach orchards in the vicinity of Fort Valley have been examined for cocoons, but there has been no cocooning or pupation to date. The first cocoon of the season last year was found on May 28. In 1936 moths were emerging by May 8.

Mississippi. J. Milton (May 24): Injury to peach trees in Hinds County, in southwestern Mississippi, was reported on May 23.

BLACK PEACH APHID (Anuraphis persicae-niger Smith)

Delaware. L. A. Stearns (May 26): Abundant over the entire State on peaches and observed on grapes at Farmington, in Kent County, on May 24.

Virginia. A. M. Woodside (May 21): Infestation has been severe, particularly on young trees, in the Staunton district. In a few orchards the infestation on mature trees has been so severe that it was necessary to apply a spray for control.

Washington. E. J. Newcomer (May 25): Reported from Yakima on young peach trees, just set out. Apparently numerous enough to prevent trees from growing.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

Connecticut. P. Garman (May 20): Reported from New Haven County on pear. Rather less abundant than usual at the beginning of the season.

New York. N. Y. State Coll. Agr. News Letter (May): In the lower Hudson River Valley all stages of the nymphs were common by the middle of the month. By the last of the month most of the eggs had hatched in western New York and a large percentage of the nymphs were in the hardshell stage.

PEAR BORER (Conopia pyri Harr.)

Virginia. A. M. Woodside (May 21): Adults of the pear borer are appearing generally in considerable numbers in bait pails in apple orchards in the Staunton district.

PEAR THRIPS (Taeniothrips inconsequens Uzel)

Oregon. D. C. Mote (May): Injury reported as serious in some Willamette Valley orchards. Emergence on March 9, oviposition on April 6, and hatching about April 15 in Umpqua Valley. Hatching on April 20 in Willamette Valley. Not numerous in Umpqua Valley and abundance spotted in Willamette Valley.

CHERRY

CHERRY LEAF MINER (Profenusa collaris MacG.)

Pennsylvania. E. P. Felt (May 24): Reported as somewhat abundant in the Philadelphia area.

Maryland. E. P. Felt (May 24): Reported as somewhat abundant in the Centerville area, on the Eastern Shore.

BLACK CHERRY APHID (Myzus cerasi F.)

New Jersey. T. L. Guyton (June 1): Reported attacking cultivated cherry at Bound Brook, in north-central New Jersey.

Utah. G. F. Knowlton (May 11): Beginning to curl cherry foliage in parts of Davis County, in northern Utah.

RASPBERRY

RED-NECKED CANE BORER (Agrilus ruficollis F.)

Virginia. C. R. Willey (April 25): In an infestation at Richmond about two-thirds of the canes were affected and at least half were either dead or badly wilted. An extremely hot spell for 2 days caused the canes to go down rather rapidly. About 80 percent of the larvae had pupated and were located 5 to 6 inches above the gall in the cane. This was the worst case of this pest I have seen.

RASPBERRY FRUITWORM (Byturus unicolor Say)

New York. N. Y. State Coll. Agr. News Letter (May): This insect is abundant in raspberry plantings in the lower Hudson River Valley.

Washington. W. W. Baker and B. J. Landis (May 17): Reported attacking raspberry, loganberry, and bush blackberry at Puyallup Valley, in western Washington. First eggs observed on May 12. Adults found feeding on Rubus spectabilis (salmon-berry) in greater numbers than usual.

RASPBERRY SAWFLY (Monophadnoides rubi Harr.)

New York. N. Y. State Coll. Agr. News Letter (May 23): Larvae are very abundant on the undersides of the young raspberry leaves and are doing much damage in Nassau County.

Kansas. H. R. Bryson (May 28): It was reported on May 25 that the raspberry sawfly had been causing considerable damage in Doniphan County, in northeastern Kansas.

BLACKBERRY

AN APHID (Macrosiphum rubicellum harpagorubus Knlt.)

Washington. B. J. Landis and W. W. Baker (May 17): Reported on evergreen blackberry from Puyallup. A few alate individuals among the apterous ones. An adult elaterid and several adults of Adalia bipunctata (L.) observed feeding on these aphids.

A SCALE INSECT (Lecanium coryli L.)

Washington. W. W. Baker and C. W. Getzendaner (May 18): Reported on cultivated Rubus and other plants at Puyallup. Continues to be abundant. First males observed on April 1.

GOOSEBERRY

A BORER (Xylocrius agassizi Lec.)

Washington. W. W. Baker (April 27): First record of commercial damage to gooseberries in Washington reported from Buckley, in Pierce County, western Washington.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

Michigan. R. Hutson (May 26): Grape leafhoppers are very numerous in raspberry plantings.

California. G. H. Kaloostian (May 18): Reported from Fowler, in southern California, in increasing abundance and as worse than last year.

PACIFIC MITE (Tetranychus pacificus McG.)

California. L. M. Smith (May 19): The Pacific mite emerged from hibernation under the bark of grapevines in San Joaquin County in large numbers late in March and early in April. In some vineyards from 10 to 15 overwintered females per leaf could be found in the early part of April, but, owing to an unusual abundance of predators, particularly mites and predaceous thrips, the population of mites has been reduced until, at the present time, none of them can be found in most vineyards where large numbers were known to have survived the winter.

A MITE (Tetranychus willamettei McG.)

California. L. M. Smith (May 18): The Willamette mite has been taken in several vineyards near Lodi and Escalon. At present severe injury can be found on the basal three or four leaves on some canes, whereas the terminal six or eight leaves show no injury nor infestation. Observations during the last 2 weeks indicate that the population is decreasing somewhat.

PECAN

A MOTH (Tortricidae)

Louisiana. L. O. Ellisor (May): The larvae of a tortricid, similar in habits and appearance to the oak ugly nest tortricid (Cacoecia cerasivorana Fitch), defoliated many pecan trees in the town of Opelousas, in south-central Louisiana, during the latter half of May. This insect first attracted attention as a pest of pecan in Opelousas 3 years ago on a limited number of trees, but since that time the infested area has increased each year, and this year included pecan trees throughout the town.

PECAN NUT CASEBEARER (Acrobasis caryae Grote)

Georgia. G. F. Moznotte (May): On May 16 noticed the first cluster of pecan nuts infested at Albany. From May 16-21 larvae were noticed in greater abundance. In some orchards the insect is practically absent, judging from infested clusters, while in other orchards as high as 25 percent of the clusters are infested. As a whole, the infestation was much less than 25 percent of infested clusters up to May 21.

CIGAR CASEBEARER (Coleophora fletcherella Fern.)

Florida. J. R. Watson (May 23): In Okaloosa and Walton Counties the cigar casebearer has been very injurious to pecan, eating out the young, unfolding buds. This insect has been more or less abundant wherever pecans are grown in Florida, but in western Florida the injury was particularly severe.

HICKORY SHUCK WORM (Laspeyresia caryana Fitch)

Georgia. G. F. Mozzette (May): On May 18 the first moths of the first generation were bred from phylloxera galls on seedling pecan trees at Albany. Although eggs were found on the foliage of budded pecan trees in orchards, no infested pecan nuts had been observed by May 23. In several pecan nurseries about Albany phylloxera galls on seedling pecan trees are heavily infested.

PECAN BUDMOTH (Gretchena bolliana Sling.)

Mississippi. G. L. Bond (May 18): Several reports of heavy damage by pecan budmoth to trees in southeastern Mississippi that have been topworked have been received.

PECAN PHYLLOXERA (Phylloxera devastatrix Perg.)

Mississippi. C. Lyle (May 24): Specimens accompanied by reports of rather heavy general infestations on pecan trees have been received recently from the Delta district.

Louisiana. C. O. Eddy (May): Abundant throughout the State.

CITRUS

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. H. T. Fernald (May 23): Earlier in the year this pest was not important in the Orlando district but a very long drought (nearly 3 months now with almost no rain) has given it an opportunity to increase greatly and do much damage to young growth.

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Mississippi. C. Lyle (May 24): Heavy infestations of this insect on Cape-jasmine were reported from Yazoo and Yalobusha Counties, in northern Mississippi, recently. A light infestation on Japanese persimmon was also reported from Harrison County, in the southern part of the State.

CITRUS MEALYBUG (Pseudococcus citri Risso)

Florida. J. R. Watson (May 23): These insects have made their appearance on grapefruit in about the usual numbers for this time of year.

ITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (May 23): Owing to the warm and dry weather rust mites have been generally abundant the past month.

COCONUT

DESTRUCTOR SCALE (Aspidiotus destructor Sign.)

Florida. H. Spencer (May 18): This insect is not so numerous in the Miami and West Palm Beach districts as it was last fall. A very large number of empty cases of Chilocorus cacti L. indicated that the coccinellid was a factor of importance in control.

PAPAYA

PAPAYA FRUITFLY (Toxotrypana curvicauda Gerst.)

Florida. H. Spencer (May 18): During April and May this fly appeared and did some damage to maturing fruits on last year's plants in the Miami district.

PAPAYA WHITEFLY (Trialeurodes variabilis Quaint.)

Florida. H. Spencer (May 23): Adults of the papaya whitefly appeared in the vicinity of Orlando about May 14.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Georgia. T. L. Bissell (May 16): Vegetable weevil attacking newly set tomato plants at Experiment in the central part of the State. (May 23): Accompanying the vegetable weevil on tomato were a number of Listroderes apicalis Wtrh. adults. On some days all of these were apparently dead as most of them had lost their legs. Heretofore, I had collected one specimen of this insect at Experiment on February 13, 1936.

Mississippi. C. Lyle (May 24): Considerable damage being done by this insect on garden and truck crops and it was reported as very numerous during May in many localities in the State.

California. J. C. Elmore (May 10): Reported attacking young tomato plants in the field at Santa Ana, Orange County.

R. E. Campbell (May 18): Vegetable weevil adults are reported to be causing considerable damage to potato foliage at Temecula, in southwestern Riverside County.

FLEA BEETLES (Malticinae)

New York. N. Y. State Coll. Agr. News Letter (May 9): Flea beetles reported from Nassau County on May 2, on tomato plants recently set out. The leaves showed considerable evidence of their feeding.

Pennsylvania. H. E. Hodgkiss (May 25): Field corn in York County, in southeastern Pennsylvania, is reported to be seriously injured by this pest.

Virginia. A. M. Woodside (May 21): Flea beetles are damaging beans in gardens in the Staunton district.

Kentucky. W. A. Price (May 28): The striped flea beetle (Phyllotreta vittata F.) is very common in gardens in central Kentucky.

Mississippi. C. Lyle (May 24): Flea beetles, Systema elongata F., were received from a correspondent at Picayune, in Pearl River County, in southern Mississippi, on May 19, with a report that a light infestation was present on cotton. N. L. Douglass reported on May 21 that flea beetles were numerous in sweetpotato plant beds.

Tennessee. G. M. Bentley (May 24): Reported on May 14 from Memphis, Shelby County, in southwestern Tennessee, on sweetpotatoes.

North Dakota. J. A. Munro (May): Flea beetles very abundant and causing serious damage, particularly to radishes in the vicinity of Fargo, in southeastern North Dakota.

Kansas. H. B. Hungerford (May 23): The spinach flea beetle (Oedionychis gibbitarsa Say) has been very destructive. The striped flea beetle on radish has also done considerable damage.

Idaho. J. R. Douglass (May 5): Complaints of flea beetle injury to radishes have been received from Jerome and Twin Falls Counties, in south-central Idaho.

Utah. G. F. Knowlton (May 27): Flea beetles are damaging recently set out tomato plants in several parts of Utah County, in north-central Utah.

Nevada. G. G. Schweis (May 9): Flea beetles were observed attacking sugar beets at Lovelock, in western Nevada, on May 9 and the damage was so severe that it necessitated the reseeding of 60 acres.

Washington. K. E. Gibson (May 20): Flea beetles were noted on young cabbage plants near Walla Walla, in southwestern Washington, where they were eating out the hearts of the plants so as to prevent the formation of heads. They were also damaging the leaves of young turnips, which would eventually result in the death of the plants.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

North Carolina. C. S. Brimley (May 28): Attacking corn seedlings at Dockery, in the northwestern part of the State.

South Carolina. J. G. Watts (May 24): The damage by this insect to cucumbers has been locally severe around Blackville, in southwestern South Carolina, but has been less so within the last 10 days. From May 21 to 24 adults were coming to trap lights in larger numbers than at any time this season. The larvae of this insect (corn bud worm) have been doing considerable damage to corn in low-lying grounds. In certain places more than 50 percent of the stand was killed. This injury was done during the latter half of April and the first 10 days of May.

Georgia. T. L. Bissell (May 23): Spotted cucumber beetles are everywhere, feeding on beans, corn, and other crops and damaging flowers. A few come to lights; also striped cucumber beetles at lights. (May 13): Larvae of this pest are killing beans at the Station at Experiment, on land which had been in Austrian peas. Adults are feeding on young watermelons. (May 16): Larvae in soil have ruined a watermelon planting at Experiment; at least 95 percent of the plants have been killed, most of them before the leaves left the soil. The planting followed vetch. Beetles of the new generation are abundant on flowers, squash, and corn. They are moving from vetch which was not plowed.

Mississippi. C. Lyle (May 24): Reports received on May 21 of abundance on and injury to melons and truck in the eastern half of the State.

Iowa. H. E. Jaques (May 26): The spotted cucumber beetle seems to be out in more than usual abundance this year. Reported from Mount Pleasant, in southeastern Iowa.

Missouri. L. Haseman (May 23): This beetle has been much less abundant than it was at this time a year ago, but in central Missouri the pest has been on wing throughout the month.

WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

Oregon. D. C. Mote (May): This insect is present generally in the adult stage on hops.

California. H. Wilcox (May 10): Adults were numerous and feeding largely on the silks, some feeding on the tassels of corn, at Olive, in the southern part of the State.

CARROT BEETLE (Ligyrus gibbosus Deg.)

Georgia. T. L. Bissell (May 23): The carrot beetle has been plentiful at lights every night since April 29 at Experiment. A few were noticed daily from April 7. No injury by this species has been noted.

South Dakota. H. C. Severin (May 20): The carrot beetles have passed the winter successfully and are extremely abundant in eastern South Dakota. Ordinarily this insect gives us very little trouble, if any, but during the last 2 years and, especially last year, it caused much damage to many flowers, and crops, besides carrots.

Nebraska. M. H. Swenk (May 20): Adults were numerous at lights in Lancaster County, in southeastern Nebraska, during May.

Kansas. H. R. Bryson (May 28): Reported on May 19 as being abundant at Lyons, in central Kansas, in a garden.

Oklahoma. C. F. Stiles (May 25): Reported damaging carrots in Woods County, in northwestern Oklahoma.

SEED-CORN MAGGOT (Hylemyia cilicrura Rond.)

New York. N. Y. State Coll. Agr. News Letter (May 16): W. J. Clark reported from Rockland County, in southeastern New York, that a 3-acre field of beans was found to be 40-percent infested with seed-corn maggot.

Ohio. D. M. DeLong (May 27): At Circleville, in south-central Ohio, a severe infestation of maggots in petioles of spinach from a 14-acre field, grown for canning purposes, was reported. Other fields in the vicinity are also infested. Appears to be the seed-corn maggot.

Illinois. W. P. Flint (May 23): This insect has been doing some damage in the northwestern part of the State. It has not been reported from any other area.

Iowa. C. J. Drake (May 27): The seed-corn maggot is widely distributed in the southern part of the State and has done considerable damage. Wet, cool weather has been very favorable to this insect.

Nebraska. M. H. Swenk (May 10): Planted corn in Polk County, in southeastern Nebraska, was reported infested with this insect at an average of five or six maggots to the kernel.

Kansas. H. R. Bryson (May 28): Was observed on May 21 infesting seed corn in a field near Norton, in northwestern Kansas, and Elbing, in the southeastern part of the State.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

Mississippi. C. Lyle (May): H. Gladney reported on May 21 that he had observed injury to peas and corn in Harrison County, in southern Mississippi. On the same date M. L. Grimes reported slight injury to corn in one field observed in Lauderdale County, in the east-central part of the State. Specimens of this species were sent in on May 19 from Biloxi, in Harrison County, with a statement that butter beans, snap beans, and other garden plants had been injured by them.

ZEBRA CATERPILLAR (Mamestra picta Harr.)

Nevada. G. G. Schweis (May 19): Reported as damaging gardens and fruit trees in central Nevada.

STRAWBERRY FRUITWORM (Cnephasia longana Haw.)

Oregon. D. C. Mote (May): Injury to strawberries, vetch, and flax present in some locations and abundant in some fields near Mount Angel, in northwestern Oregon. Third to fifth instars present.

GREEN PEACH APHID (Myzus persicae Sulz.)

Maryland. E. N. Cory (May 24): Did serious damage to spinach carried over winter, causing some rejections in the Baltimore market. The infestation on new spinach started to build up in Baltimore and Harford Counties, but no serious damage is evident at this time.

Colorado. J. H. Newton (May 23): First stem mothers hatched in western Colorado on March 7. Degree of infestation ranged from light to heavy.

Mississippi. C. Lyle (May 24): **A rather heavy** infestation of this pest **in sweetpotato plants in beds was reported early in May at Purvis, in Lamar County,, and at Wiggins, in Stone County, both in southern Mississippi.**

SPITTLE BUGS (Cercopidae)

Delaware. L. A. Stearns (May 23): More than normally abundant on clover and alfalfa throughout the State and present on strawberries at Clayton, Kent County, in considerable numbers.

Oregon. D. C. Mote (May): Injury by a spittlebug, Philænus leucophthalmus L., normal in the Willamette Valley, but abundant in the southern part of the valley. Third and fourth instars present. Injury by another spittlebug, Aphrophora permutata Unl., normal in the valley, with third and fourth instars present.

EUROPEAN EARWIG (Forficula auricularia L.)

Washington. E. W. Jones (May 20): The first brood of this insect has hatched and is fairly abundant in home gardens in Walla Walla. Also reported in apricot trees.

Oregon. D. C. Mote (May): The young are present generally and are above ground.

CRICKETS (Gryllidae)

Florida. H. T. Fernald (May 23): Mole crickets are frequent on higher ground now, making their shallow burrows in lawns and grasslands in the Orlando district.

Mississippi. C. Lyle (May 24): On April 27 Scapteriscus acletus R. & H. was reported in a garden and melon patch in Clark County, in eastern Mississippi.

Nebraska. M. H. Swenk (May 4): A specimen of the mole cricket Gryllotalpa hexadactyla Perty was sent in from Dakota County, in eastern Nebraska. (May 17): A complaint of the infestation of a cave by crickets (Gryllus assimilis F.) was received from Nemaha County, also in the eastern part of the State.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

New York. N. Y. State Coll. Agr. News Letter (May): This pest is very abundant on Long Island. The beetle was first observed on April 28. Farmers report that the insect is 3 weeks earlier than usual. Numerous egg masses were observed on May 17.

New Jersey. J. B. Schmitt (May 24): Colorado potato beetles are emerging in large numbers and causing some injury to young tomatoes and potatoes. Distributed generally.

Delaware. L. A. Stearns (May 14): Present in about average abundance in potato fields of southern Delaware.

Virginia. H. G. Walker and L. D. Anderson (May 25): The Colorado potato beetle has been very abundant and has done considerable damage in potato fields in the Norfolk vicinity where they have not been properly controlled.

Indiana. J. J. Davis (May 23): Adults were doing considerable damage to field-sown tomato plants on April 5 at Boonville, in southwestern Indiana. At Vincennes we observed adults out and laying eggs freely on tomato seedlings on April 30. Other reports indicate the adults and larvae occurring in destructive abundance in several localities of southern Indiana.

Kentucky. W. A. Price (May 28): These insects are more abundant than usual. Larvae did much damage in large plant beds of tomatoes at Owensboro, in northwestern Kentucky.

Tennessee. G. M. Bentley (May 24): Several observations made. Found feeding on Irish potato during the first 2 weeks in May in four counties in the western half of the State.

Mississippi. C. Lyle (May 24): L. J. Goodgame, of Aberdeen, and N. L. Douglass, of Grenada, both in central Mississippi, reported on May 21 that Colorado potato beetles were numerous on Irish potatoes and tomatoes in their districts.

- Louisiana. B. A. Osterberger (May): Either harvesting or maturing of potato plants has caused a general movement of these insects over to tomatoes. Where control measures were not used the plants have been completely killed.
- Missouri. L. Haseman (May 23): As usual, this pest began to appear with the development of early potatoes. During the middle of the month at Columbia adult beetles were taken in great numbers in gardens and old potato fields and egg laying began to show up around May 15.
- Oklahoma. C. F. Stiles (May 25): The Colorado potato beetle has been reported in the eastern half of the State in unusually large numbers.
- Idaho. B. F. Coon (May 31): One adult beetle found on a small volunteer potato plant 5 miles west of Buhl, **This is believed to be the first report of this insect in south-central Idaho.**
- Utah. G. F. Knowlton (May 18): Adults are scarce in the small infested area of Davis and Weber Counties, in northern Utah.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

- Connecticut. N. Turner (May 21): One acre of cucumber seedlings seriously damaged. Generally prevalent on potatoes.
- Pennsylvania. H. E. Hodgkiss (May 25): Adults present generally and had severely injured potato foliage.
- Delaware. L. A. Stearns (May 20): Abundant generally throughout Sussex and Kent Counties on newly set tomato plants.
- Virginia. L. D. Anderson and H. G. Walker (May 25): The potato flea beetle emerged from hibernation about 2 weeks earlier than usual this year and they were very abundant and injurious early in the season in the Norfolk district. However, most of the overwintering beetles have died and they are now relatively scarce in the fields.
- Oregon. D. C. Mote (May): Emerging on May 15.

CORN EAR WORM (Heliothis obsoleta F.)

- Georgia. T. L. Bissell (May 9): A tomato field at Tifton, in south-central Georgia, was noted with fruit well infested, a few worms nearly grown. At Experiment on May 1 the eggs which were first laid on April 26 had started hatching. Few worms on vetch. (May 23): Eggs of this insect have been found on tomato plants at Experiment today, 60 eggs on 70 plants (only 1 hatched egg) and these are about the first on tomato. First-generation worms on vetch are about mature. (May 25): This insect has started depredations on tomatoes at Clarkston, in north-western Georgia. Many first- and second-instar larvae in very small fruits and on leaves. One larva noted that was probably third instar, being half an inch long.

TOMATO PINWORM (Gnorimoschoma lycopersicella Busck)

California. J. C. Elmore (May 18): The tomato pinworm is unusually abundant on early tomatoes in the San Pedro Hills area, in southern California. From 1 to 3 leaf folders per plant were found on the ocean front and from 5 to 13 per plant on the bay side of the hills. Only a trace of pinworm damage could be found in this area in May 1937.

HORNWORMS (Protoparce sp.)

Georgia. T. L. Bissell (May 23): Two small hornworms found on tomato at Experiment on this date.

Utah. G. F. Knowlton (May 23): Tomato worm injury was severe on tomatoes at Minersville, in southwestern Utah, in 1937.

California. J. Wilcox (May 16): First eggs of the year of the tomato hornworm were found on tomato plants about 1 foot in diameter. Reported from Olive, in the southern part of the State.

STALK BORER (Papaipema nebris nitela Guen.)

Missouri. L. Haseman (May 23): Since the 15th of May young stalk borers at Columbia have been on the increase, boring into the leaf stalks and into the stems of potatoes, other crops, wild plants, and woods. Indications are that this pest is going to be rather severe.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Virginia. H. G. Walker and L. D. Anderson (May 25): These insects are very scarce in all of the potato fields examined in the Norfolk area; however, adult leafhoppers were moderately abundant and newly hatched nymphs quite numerous in a field of broad beans near Portsmouth.

TOMATO PSYLLID (Paratrioza cockerelli Sulc.)

Colorado. G. H. List (May 28): This pest was very abundant on potatoes at Fort Collins, in north-central Colorado, on May 17. This is an unusually heavy infestation for so early in the season, 10 adults and 22 eggs being counted on 1 plant.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

New York. N. Y. State Coll. Agr. News Letter (May): Beetles were emerging from hibernation on Long Island about the middle of the month, although they were not observed on bean plants.

New Jersey. T. L. Guyton (June 1): Overwintering adults not especially numerous on beans at Bound Brook in north-central New Jersey.

Pennsylvania. H. E. Hodgkiss (May 25): Adults were beginning to feed on garden beans in Franklin County, in south-central Pennsylvania, on May 9.

North Carolina. W. A. Thomas (May 20): This insect has shown up earlier than usual on the beans in the Chadbourn area, in the south-central part of the State. The adults have already seriously checked the growth of spring beans where no control methods have been practiced. No larvae have been observed.

South Carolina. J. G. Watts (May): The bean beetle has been observed in larval and adult stages at Williston, Blackville, and Charleston, in the southern part of the State, during the month. The damage thus far is not severe in any of these localities.

Georgia. C. H. Alden (May 20): Moderate injury to snap beans reported from Cornelia, in northeastern Georgia.

T. L. Bissell (May 23): This pest came out early, on April 28, or before. On May 4 we received specimens from Vidalia, Toombs County, in southeastern Georgia. (June 3): Larvae feeding and becoming injurious at Experiment. Adults feeding and a few eggs found at Tifton.

Ohio. N. F. Howard (May 5): One adult of this insect was taken at Columbus on April 30. Several egg masses were found at South Point on May 5, indicating that beetles had left hibernation at least 12 days previously. This is probably the earliest record for that latitude. (May 23): Cool weather and frequent heavy rains at South Point have retarded reproduction of the beetle and have aided materially in control.

Alabama. J. M. Robinson (May 19): Has appeared at Auburn and the larvae of the first generation are in the last instar.

Mississippi. C. Lyle and assistants (May 24): Reports from the eastern half of the State indicate heavy infestations on beans.

Colorado. R. L. Wallis (May 21): Beetles have successfully passed the winter in numbers much larger than normal and are emerging from hibernation in the vicinity of Grand Junction and Grand Valley, in west-central Colorado.

BEAN LEAF BEETLE (Corotoma trifurcata Forst.)

Virginia. C. R. Willey (May): Apparently more abundant this season than usual. We have had a number of complaints from near Richmond and several from out in the State. One gardener sent in several hundred stating that he had never encountered the pest before.

H. G. Walker and L. D. Anderson (May 25): Rather abundant in some bean plantings, feeding being especially noticeable in the Norfolk section during the dry weather the first part of May.

Ohio. H. C. Mason and R. H. Nelson (May): Adult beetles were very numerous at South Point, occurring in greater numbers than for several years. Estimates of leaf surface consumed on some bean patches in the most heavily infested parts of the field ran as high as 35 to 40 percent.

Tennessee. G. M. Bentley (May 24): On May 8 the lower leaves of beans were reported as having been badly eaten by this insect in many parts of the State.

Mississippi. H. Gladney (May 24): Slight injury to beans in Jackson and Harrison Counties, on the Gulf coast, reported on May 21.

CABBAGE

IMPORTED CABBAGE WORM (Pieris rapae L.)

Maine. A. E. Brower (May 14): Adults reported appearing in the vicinity of Bar Harbor.

Connecticut. N. Turner (May 21): Butterflies appeared early in May and young larvae are common. Little damage done.

Maryland. E. N. Cory (May 24): Reported as being present in Montgomery County, in western Maryland.

Virginia. H. G. Walker and L. D. Anderson (May 25): These insects have been moderately abundant and the larvae have caused considerable damage in some fields in the Norfolk area.

Georgia. T. L. Bissell (May 23): A report of cabbage worms from Spalding County, in west-central Georgia.

Ohio. N. F. Howard (May 23): Early cabbage is exceptionally clean. Adults are not very numerous and eggs and larvae are very scarce at South Point.

A CABBAGE BUTTERFLY (Pieris monuste L.)

Florida. H. T. Fernald (May 23): Very little evidence of any migratory flight thus far this spring, along the Indian River. On May 6 a few were seen near Cocoa, all working south as would be expected in that locality, but there was no real migratory flight.

CABBAGE MAGGOT (Hylemyia brassicae Bouche)

Connecticut. N. Turner (May 21): Observations show a very heavy infestation with serious damage in the western half of the State. Untreated plants are dying and improperly treated ones are moderately infested.

A. W. Morrill, Jr. (May 1 - 17): These root maggots have caused considerable trouble to local growers of cabbage and radishes in Hartford County. Numerous calls for information have been received

from growers, many of whom also grow tobacco and were apprehensive lest this pest extend to tobacco, commonly attacked in scattered fields by H. cilicrura Rond.

Pennsylvania. H. E. Hodgkiss (May 25): Adults were laying eggs abundantly but none were hatched on May 12 in the southeastern counties.

New Jersey. J. B. Schmitt (May 24): ~~Cabbage maggot~~ is showing a very light infestation as compared with the preceding 2 years and even in nontreated plantings the injury is almost negligible.

CABBAGE CURCULIO (Ceutorhynchus rapae Gyll.)

Ohio. T. H. Parks (May 20): Reported that they were causing some injury to early cabbage in the southern part of the State.

CABBAGE SHOOT WEEVIL (Ceutorhynchus assimilis Payk.)

Washington. M. J. Forsell (May 26): Reported on cabbage and turnips from the western part of the State. The threatened damage of this pest for the season of 1938 appears at present to be much smaller than that occasioned during the season of 1937.

HARLEQUIN BUG (Murgantia histrionica Hahn)

North Carolina. W. A. Thomas (May 20): The nymphs of this insect are extremely abundant on some of the cruciferous crops in the Chadbourn area, having already caused serious loss in the home gardens by killing many of the plants.

Tennessee. G. M. Bentley (May 24): On May 8 this pest was reported as infesting cabbage at Memphis, Shelby County.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Virginia. H. G. Walker and L. D. Anderson (May 25): Squash bugs are moderately abundant in some squash fields in the Norfolk district, where they are depositing a rather large number of eggs.

South Carolina. J. G. Watts (May 25): Squash bugs have been found on squash and cucumbers during most of the month in the Blackville area but no perceptible damage has been observed. Egg laying has begun.

Louisiana. L. O. Ellisor (May): Overwintering adults of the pest are mating and laying eggs at Baton Rouge.

Utah. G. F. Knowlton (May 4): Squash bugs are active and abundant in the Ogden-Merriott area of Weber County.

SQUASH BORER (Melittia satyriniformis Hbn.)

Louisiana. L. O. Ellisor (May): The squash borer is very destructive to squash at Baton Rouge.

PEAS

PEA APHID (Illinoia pisi Kltb.)

Connecticut. N. Turner (May 21): Observations in New Haven and Fairfield Counties show no pea aphids as yet.

New York. N. Y. State Coll. Agr. News Letter (May): The pea aphid was reported on peas during the first half of the month on Long Island. On May 9 the insect was observed to be increasing rapidly at Geneva and migration from alfalfa to peas had started.

Delaware. L. A. Stearns (May 13): Infestation more severe than usual throughout southern Delaware.

Maryland. E. N. Cory (May 24): First report received on April 23. General infestation over the State, although not doing serious damage in northern Maryland along the Pennsylvania line. The infestation has been very heavy, with continuous migration from clover, and continuous breeding, notwithstanding careful spraying and dusting. The infestation on the Eastern Shore has been accompanied by mosaic, and the two will probably result in a heavy decrease in the crop.

Virginia. H. G. Walker and L. D. Anderson (May 24): Most of the early peas in Norfolk and Princess Anne Counties matured without being appreciably injured by the pea aphid. However, several late fields of peas and several fields of broad beans have been very seriously injured by this pest in these two counties. Although the pea aphid was not as destructive in Northampton and Accomac Counties as last year, it caused considerable injury where control measures were not applied. The injury was apparently more severe in the northern part of Accomac County than farther south.

Wisconsin. J. E. Dudley, Jr. (May 4): Aphids increasing rapidly in Madison and vicinity. There is evidence that a flight is in progress from the southwest, as unusually large numbers of alate forms are present. (May 20): Aphids are slowly increasing in alfalfa. Infestation is still light. Early planted Alaska peas very lightly infested.

Mississippi. J. Milton (May 24): English peas heavily infested with aphids in Madison County, in west-central Mississippi.

MELONS

SQUASH BEETLE (Epilachna borealis F.)

North Carolina. W. A. Thomas (May 19): Adults are much more numerous this season than last. Some damage is being done to young melons, which is rather unusual for the Chadbourn area, as these insects rarely show up in abundance until late in July.

CUCUMBERS

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

Connecticut. N. Turner (May 23): A few beetles were seen on May 21 and were numerous on May 23.

New York. N. Y. State Coll. Agr. News Letter (May 9): Reported from Erie County, in western New York, that the striped cucumber beetle has emerged from hibernation quarters, as several of the beetles were caught in a light trap on the night of May 5. That day a maximum of 90° F. was recorded in the southern part of the county.

Virginia. H. G. Walker and L. D. Anderson (May 25): Many fields of cucurbits in the Norfolk region have been heavily infested with the beetles, while other fields have been practically free of injury.

South Carolina. J. G. Watts (May 25): This insect has been present in the Blackville area in relatively small numbers, and much less numerous than the spotted cucumber beetle.

Georgia. T. L. Bissell (May 23): Striped cucumber beetles were taken at lights at Experiment.

Ohio. N. F. Howard (May): Large numbers of striped cucumber beetles were observed on volunteer squash plants that had come up in a plowed field at Columbus, owing to the very early spring. They were so numerous that the small squash plants had been almost devoured when discovered on May 5. On the same day reports from South Point indicate the cucumber beetle as being extremely numerous and injurious to early cantaloups and cucumbers. Petals had fallen from apple and other fruit several days before the beetles were discovered. Undoubtedly the beetles had been forced to leave the blossoms 2 weeks or more earlier than usual.

Mississippi. C. Lyle (May 24): Heavy infestations on cucumbers, melons, and other crops were observed in Harrison, Jackson, Lauderdale, and Tate (northwestern Mississippi) Counties. The heaviest infestation in several years is present on cucumbers in the vicinity of Wiggins, Stone County.

Louisiana. L. O. Ellisor (May): The striped cucumber beetle is very abundant on cucumbers and melons in southern Louisiana.

Missouri. L. Haseman (May 23): This beetle was first observed at Columbia as fruit trees began to come into bloom ahead of the early April freeze and beetles in scattering numbers have been observed almost continuously since that time but, with very little gardening under way to date, there have been practically no reports of the beetle on cucumbers and related crops.

Nebraska. M. H. Swenk (May 20): Became numerous at lights in Lancaster County after the middle of May.

Utah. G. F. Knowlton (May 23): A report from Moab, in southeastern Utah, indicates this pest causing severe damage to melons and cucumbers.

GARDEN FLEA HOPPER (Halticus citri Ashm.)

Indiana. J. J. Davis (May 23): Garden flea hoppers were damaging greenhouse cucumbers at Terre Haute in February. This is the first report ever received of injury by this insect in greenhouses.

GARDEN SPRINGTAIL (Bourletiella hortensis Fitch)

Connecticut. N. Turner (May 24): A springtail, probably of this species, was locally abundant injuring cucumber seedlings at Southington, in western Connecticut.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

South Carolina. J. G. Watts (May): There has been relatively little increase in beetle population in Barnwell County, in the southwestern part of the State, since harvest. Damage is not serious.

Alabama. F. E. Guyton (April 27): In 1937 this insect was observed for the first time in Alabama. Larvae were seen on asparagus this year at Auburn on April 27.

Indiana. J. J. Davis (May 23): The common asparagus beetle reported on May 21 as having destroyed 25 percent of a 16-acre field of asparagus at Fort Wayne, in northeastern Indiana.

Colorado. J. H. Newton (May 23): Adults and eggs abundant in certain fields near Denver on May 18.

Utah. G. F. Knowlton (May 4): Adults and eggs abundant in one field of asparagus at Merriott in Weber County, and are present in a field south of Sunset. (May 26): Adults and eggs are abundant on asparagus at Clearfield and Sunset, but larvae are scarce.

Washington. C. W. Getzendaner (May 10): The asparagus beetle attracts more attention each year in the Puyallup Valley in west-central Washington.

M. H. Hatch (May 25): This species has within the last few days occurred at Renton and Bothell, this being the first occurrence this far north in western Washington.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Ohio. N. F. Howard (May 23): Heavy infestation of turnip aphids occurred on a patch of turnips near South Point.

CELERY AND CARROTS

CARROT WEEVIL (Listronotus latiusculus Boh.)

New Jersey. J. B. Schmitt (May 24): The carrot weevil is doing considerable damage to celery on the muck area in Bergen County, in north-eastern New Jersey, and is injuring carrots as far south as Vineland.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Connecticut. N. Turner (May 23): A few nymphs and many adults on 10 acres of set onions in Hartford County. More than usual are present for so early in the season.

Virginia. H. G. Walker and L. D. Anderson (May 25): Onion thrips are beginning to appear on onions in rather injurious numbers in the Norfolk area. Some fields of cabbage are becoming rather heavily infested with what is probably the onion thrips.

Florida. J. R. Watson (May 23): Thrips have been unusually injurious, including the onion thrips on onions, owing to the unusually hot and dry weather of the last month.

Mississippi. C. Lyle (May 24): Several reports recently from southeastern Mississippi of heavy infestations of thrips on onions.

California. J. Wilcox (May 4): The tops on one 4-acre field of large onions at Artesia, in southern California, show severe damage and the grower estimates that most of the crop will be lost. A 4-acre field of younger onions, although not showing much damage, is heavily infested.

STRAWBERRY

STRAWBERRY WEEVIL (Anthonomus signatus Say)

Delaware. L. A. Stearns (May 17): Unusually abundant and damaged crop severely in Sussex County, causing considerable injury to blackberries in plantings near strawberry fields.

Maryland. E. N. Cory (April 27): Reported on strawberries in Prince Georges and Somerset Counties.

Virginia. L. D. Anderson and H. G. Walker (May 25): Since our observations on April 15 the strawberry weevil became quite active in a number of strawberry fields in the northern part of Accomac County on the Eastern Shore and has cut out about 60 percent of the buds in several of the fields examined. Although these weevils only cut about 15 percent of the buds in a strawberry field at Onley, in Accomac County, they cut over 90 percent of the buds in a small planting of dewberries nearby.

North Carolina. W. A. Thomas (May 20): The new generation began emerging from the pupal stage the latter part of the first week of May in the Chadbourn area. This is approximately 2 weeks earlier than usual.

Kansas. H. R. Bryson (May 28): The strawberry weevil was reported on May 25 as causing damage in one locality north of Blair in Doniphan County, in northeastern Kansas.

A CHRYSOMELID (Timarcha intricata Hald.)

Washington. W. W. Baker (May 4): Reported from Rochester and Grand Mound, in southwestern Washington, as attracting more attention than usual on strawberries.

STRAWBERRY LEAFROLLER (Ancylis comptana Froel.)

New York. N. Y. State Coll. Agr. News Letter (May 9): Reported from Suffolk County, in eastern New York, that strawberry leafrollers were noted in a strawberry plantation on May 2.

Indiana. J. J. Davis (May 23): Strawberry leafroller was quite abundant and destructive the last 2 weeks at Knightstown and Gary, in eastern and northwestern Indiana, respectively.

Kansas. H. R. Bryson (May 28): Strawberry leafroller is more abundant in northeastern Kansas than for several years and is causing severe injury. Reported injuring strawberries at Grantsville.

Utah. G. F. Knowlton (May 12): Strawberry leafroller moths are abundant at Riverdale and Providence, in northern Utah.

APHIDS (Aphididae)

Virginia. H. G. Walker and L. D. Anderson (May 25): A strawberry field near Norfolk was found to be heavily infested with the strawberry root louse (Aphis forbesi Weed). Many of the plants have been killed and the others are sick and unthrifty, owing to the injury caused by this pest. Ants are abundant in this field where they are attending these aphids and the ants have honeycombed the ground around the roots of the infested plants.

Oregon. D. C. Mote (May): Aphids reported common in all stages on strawberries in the Willamette Valley.

COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker and L. D. Anderson (May 25): These pests continued to be abundant and to cause considerable damage in a number of strawberry fields in Norfolk and Princess Anne Counties in May.

North Carolina. W. A. Thomas (May 14): The red spider continues to give considerable trouble to the berry growers in the area around Chadbourn. Some of the fields have been so seriously affected that no efforts will be made to carry the plants over, but they will be turned under as soon as the picking season is over. Control measures are being employed by a few growers.

Mississippi. C. Lyle (May 24): Strawberry plants heavily infested with these mites were sent in on May 10 from Moselle, Jones County, in southeastern Mississippi.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

California. J. C. Elmore (May 11): The pepper weevil is more numerous than usual on black nightshade (Solanum nigrum). Larvae and pupae are common in nightshade berries on the ground in the Bellflower district, in southern California.

BEEETS

HOP FLEA BEETLE (Psylliodes punctulata Melsh.)

Utah. G. F. Knowlton (May 4): Damage to sugar beets has been observed at Farr West, Hot Springs, and Merriott, in Weber County. (May 10): This insect is damaging sugar beets at Mapleton and Woods Cross.

H. E. Dorst (May 28): The hop flea beetle population on sugar beets in northern Sevier Valley averages about 3 per square foot, as compared with 15 to 18 in 1937. No damage has been observed. Some damage is noticeable on young sugar beets near Garland and Corinne, where the population averages about 16 **per square foot of beet row**. The long distance movement of beet leafhopper into Sevier Valley averages in population about 18 per 100 square feet of beets, as compared to approximately 300 per 100 square feet in 1937. A few migrants were found as far north as Lehigh on May 26. The movement of the pest from the local breeding areas and northern Utah started on May 27.

TOBACCO

TOBACCO FLEABEETLE (Epitrix parvula F.)

Maryland. E. N. Cory (May 24): The tobacco fleabeetle was reported doing serious damage to tobacco beds in Anne Arundel, Prince Georges, and Charles Counties, in central and southern Maryland.

South Carolina. N. Allen, J. W. Humphreys, and D. B. Lieux (May 23): Injury to plants in the field in Florence, Marion, and Horry Counties, in northeastern South Carolina, has been less severe than in 1936 or 1937, owing apparently to fewer beetles and to more favorable weather conditions for plant growth at transplanting time. On May 17 a brood of newly emerged beetles was severely injuring plants in plant beds, although transplanting to the field was practically complete.

Tennessee. G. M. Bentley (May 24): Reported as attacking tobacco at Clarksville, in northwestern Tennessee.

L. B. Scott (May 19): The tobacco flea beetle was normally abundant in tobacco plants in the north-central region but has not appeared in normal numbers on transplanted tobacco. Continued cool, wet weather in May probably interfered with their activities.

GREEN JUNE BUG (Cotinis nitida L.)

Pennsylvania. H. E. Hodgkiss (May 25): Grubs of this pest were causing severe injury to tobacco beds in Lancaster County on May 13.

TOBACCO BUDWORM (Heliothis virescens F.)

South Carolina. N. Allen, J. W. Humphreys, and D. B. Lieux (May 23): The first budworm larva was observed in Florence County on April 25. During the first week in May, when the plants were just becoming well established in the field, infestations were sufficient to require control measures. This is unusually early for budworm infestation in the field.

Florida. F. S. Chamberlin (May 11): Infestations of the budworm in tobacco fields in Gadsden County, in western Florida, appear to be about normal.

HORNWORMS (Protoparce sp.)

Maryland. E. N. Cory (May 1): Large numbers of pupae being turned up by plows in last year's tobacco fields. Infestation seems to be heaviest in Anne Arundel and Charles Counties.

South Carolina. N. Allen, J. W. Humphreys, and D. B. Lieux (May 23): The first hornworm eggs were observed on May 4 at Florence. By May 23 hornworm larvae were sufficiently abundant to warrant control measures. The infestation is abnormally severe for this early in the season.

CORN ROOT WEBWORM (Crambus caliginosellus Clem.)

Tennessee. L. B. Scott (May 19): The corn root webworm is very prevalent in north-central Tennessee in soil that had not been worked for 2 years or more. Damage is very severe, reaching 100 percent in untreated fields.

GARDEN FLEA HOPPER (Halticus citri Ashm.)

Florida. F. S. Chamberlin (May 23): The garden flea hopper continues to be unusually abundant in crops of shade-grown tobacco in Gadsden County.

TOBACCO THRIPS (Frankliniella fusca Hinds)

Florida. F. S. Chamberlin (May 17): Thrips are abundant and are causing some damage to shade-grown tobacco in Gadsden County.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. J. G. Watts (March, April, and May): Taken in very small numbers at Blackville, in southwestern South Carolina, in late March, and in April and May. The first were taken on March 23. None found on cotton.

F. F. Bondy (May 30): Counts at Florence, in the northeastern coastal plain, indicate that there are large numbers of boll weevils in cotton fields, as many as there were last year and more than in 1935 or 1936.

Georgia. P. M. Gilmer (May 22): At Tifton, in southern Georgia, drought and cool weather have delayed weevil emergence from hibernation and growth of cotton during the last few weeks. Although weevils have diminished in the fields, there are enough to cause severe injury.

W. L. Lowry (May 28): Weevils are plentiful in most fields of Sea Island cotton in Lowndes and Echols Counties, in southeastern Georgia. Punctured squares are evident and full-grown larvae were found during the week. Weevils are scarce in the few fields where the stalks were destroyed early last fall and the fields cleaned up.

Florida. C. S. Rude (May 21): Showers have started the cotton squaring, and weevils in the fields have increased at Gainesville and in northern Florida. (May 28): Weevils are more abundant than during recent years.

Louisiana. B. A. Osterberger (May 24): Boll weevils reported attacking very small squares in some of the plots at the University Farm at Baton Rouge, in south-central Louisiana. This is the first record of adult boll weevils reported to the Department.

R. C. Gaines (May 27): At Tallulah, in Madison Parish, north-central Louisiana, more weevils were taken and more found in the field during the latter part of May than last year, despite the fact that emergence from hibernation cages has been lower.

Texas. F. L. Thomas (May 20): Boll weevils have been found in four of five fields examined in Hidalgo County, in southern Texas. A maximum infestation of 10 percent was found in one field. In Nueces County, in southeastern Texas, an 8-percent infestation was found and in Brazos County, in the eastern part of the State, large numbers of weevils were counted in a field of newly chopped cotton. (May 25): The infestation in Hidalgo County has doubled during the last week and now averages 12 percent, with a maximum infestation of 24 percent of the squares punctured. All fields examined found to be infested. Approximately 400 weevils per acre found in cotton of presquare age in fields of Brazos, Jackson, and Victoria Counties, in eastern and southeastern Texas.

K. P. Ewing (May 14): Eight percent of the squares were infested in one field examined near Odem, in southeastern Texas. No other weevils were found in the vicinity or at Robstown, in Nueces County. (May 28): Weevils are abundant in fields in the Lavaca River bottoms, Jackson County. An average of 4.59 weevils per 100 plants, or over 800 per acre, were found in the 13 fields examined this week. Weevils are scarce in open-prairie sections of Calhoun County, in southeastern Texas.

R. W. Moreland (May 28): There has been an emergence from hibernation cages of 3.75 percent to date, as compared to 5.25 percent in 1937 and 2.04 percent in 1936 during the same period, at College Station, in eastern Texas. Weevil populations in the fields examined are practically the same as last year.

SALT-MARSH CATERPILLAR (Estigmene acraea Drury)

Georgia. S. B. Penne (May): This outbreak at Vienna in Dooly County, in southwestern Georgia, is the second severe one reported from this State. The other was near Donalsonville, Seminole County, in the same part of the State.

Texas. F. L. Thomas (May 25): Salt-marsh caterpillars are reported to be causing some injury to cotton in southern Texas.

K. P. Ewing (May 21): Many fields of cotton in Calhoun County (Gulf coast area) were infested with salt-marsh caterpillars. (May 28): This insect is very widespread over the whole county and many complaints have been received of damage to cotton and vegetable crops. Infestation is more widespread than noticed before.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Texas. F. L. Thomas (May 25): Reports from Nueces and Calhoun Counties indicate that some of the early appearing leaf worms are "webbing up."

K. P. Ewing (May 20): The first cotton leaf worm, about one-third grown, was found on May 2 in Calhoun County in stubble cotton. This is the earliest record in recent years. Three full-grown larvae and an empty pupal case were found today on cotton in Calhoun County, indicating the appearance of the second generation. (May 28): Only one additional infestation was found this week. This makes a total of four infestations found in Calhoun County, and one in Nueces County.

PINK BOLLWORM (Pectimophora gossypiella Saund.)

Texas. A. J. Chapman (May 21): At Presidio, in the Big Bend area, the emergence of moths in the hibernation cages was much higher during May last year than for the same period this year. There is an unusually large amount of "Zoca" cotton, which is squaring and blooming profusely and is heavily infested. This will serve to build up the population that will later migrate to cultivated cotton. (May 28): It appears now that the peak of emergence from hibernation is over.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Mississippi. R. L. McGarr (May 28): Flea hoppers in the vicinity of State College, northeast of the central part of the State, increased from 0.5 per 100 plants on May 14 to 5.0 per 100 plants on May 28.

Louisiana. R. C. Gaines (May 28): At Tallulah, in northeastern Louisiana, sweepings of evening primrose and other weed hosts indicate that flea hoppers are much less abundant than last year.

Texas. F. L. Thomas (May 6): Flea hoppers are increasing on their preferred weed host plants in south-central Texas, as cotton is at present too small to be attractive. Hatching is general in northern Texas. (May 13): The hatch of flea hoppers to date from croton weeds collected in eight counties of south-central Texas has been less than average, not only for the first 2 weeks in May but also for the season. The hatch from similar weeds collected from four counties in northern Texas and caged at the Denton substation was twice as great during the last week of April as that in central Texas for the same period. (May 20): Flea hoppers are increasing on cotton in the lower Rio Grande Valley, the coastal areas, and in the Brazos River Valley. They already occur in sufficient numbers in some fields to justify application of control measures. Infestation reached a maximum of 92 per 100 terminal buds at Chapman Ranch in Nueces County. The average flea hopper infestation in 5 fields examined in Nueces County was 48 per 100 buds. The number of hoppers on horsenut in Calhoun County has increased almost 100 percent over the previous week. Screen traps in the Brazos bottoms show that flea hoppers are still entering the cotton

fields to augment the present count of 9 per 100 buds. (May 25): Screen-trap records in Burleson County, in southeastern Texas, indicate that flea hoppers continue to migrate into cotton fields from native host plants. A slight increase in the population of nymphs was noted during the past week.

K. P. Ewing (May 14): The peak of emergence of cotton flea hoppers from 39 hibernation cages under observation at Port Lavaca was during the last 5 days of April and the first 4 days of May, which is later than ever recorded in southern Texas. The field infestations show considerable increase over previous weeks. On May 13 sweepings made in four fields of horsemint in Calhoun County showed almost a 100-percent increase over the week before. (May 28): The flea hopper population in cotton fields in Calhoun County remained about the same as last week. Control measures have been necessary in some fields in Nueces County.

R. W. Moreland (May 28): At College Station as many as 12 nymphs per 100 cotton terminals were found in river-bottom fields.

TARNISHED PLANT BUG (Lygus pratensis L.)

Georgia. P. M. Gilmer (May 22): A few tarnished plant bugs were present on cotton in the vicinity of Tifton, in southern Georgia.

Mississippi. R. L. McGarr (May 28): At State College a large increase in the tarnished plant bug population on fleabane and other weeds was noted this week. The catch per 100 sweeps was 1,100 adults and 2,300 nymphs.

Louisiana. R. C. Gaines (May 28): Tarnished plant bugs are becoming abundant on weeds in the vicinity of Tallulah, in Madison Parish.

Arizona. T. P. Cassidy (May 14): The weekly sweeping records in the Tucson district still show a rather heavy infestation of Lygus spp. in alfalfa. One field showed 45 per 100 sweeps.

COTTON APHIDS (Aphidae)

South Carolina. J. G. Watts (May): The first specimens of the cowpea aphid (Aphis medicaginis Koch) were observed on cotton on April 25. Since then there has been little rain and, as a result, this insect has increased rather rapidly. Its numbers at present are not serious but it may develop into destructive numbers with continued dry weather.

C. F. Rainwater (April 30): The three species of root aphids (Trifidaphis phaseoli Pass., Rhopalosiphum subterraneum Mason, and Anuraphis maidi-radicis Forbes) are present and causing considerable damage to the stands of cotton in Florence County. It was necessary to replant some fields; in others young seedlings were badly stunted.

A. maidi-radialis was also found on corn and volunteer soybeans.
(May 28): Root aphids continue to damage cotton.

Georgia. P. M. Gilmer (May 22): During the latter part of April and the first part of May cotton aphids (Aphis gossypii Glov.) appeared in some numbers at Tifton but at present there are almost none.

Florida. C. S. Rude (May 27): There are a few cotton aphids in some places near Gainesville, but they are not serious. Parasites seem to be holding them in check.

Mississippi. R. L. McGarr (May 28): At State College cotton aphids are common in most of the cotton fields but parasites and predators are rapidly reducing their numbers.

Arizona. T. P. Cassidy (May 7): A very heavy infestation of aphids, which is causing concern to the grower, has developed in a limited acreage of cotton at Marana, Pima County, in south-central Arizona. Both parasites and predators are beginning to appear. (May 28): Cotton is rapidly recovering from this infestation.

THRIPS (Thysanoptera)

South Carolina. J. G. Watts (May 25): The tobacco thrips (Frankliniella fusca Hinds), the flower thrips (F. tritici Fitch), and Sericothrips variabilis (Beach) are doing less damage than normal for this season of the year in Barnwell County, in the southwestern section of the State.

C. F. Rainwater (May 7): The tobacco thrips and onion thrips (Thrips tabaci Lind.) were causing some local injury to cotton in the vicinity of Florence the last week of April. (May 30): Thrips are fewer in number because of rains but many cotton fields show severe damage.

Mississippi. E. W. Dunnam (May 28): At Stoneville, in the Delta section, thrips appear to be fairly abundant in some fields, and some debudding has taken place.

Louisiana. C. O. Eddy (May): The flower thrips has been abundant on cotton for 2 or 3 weeks but there have been few tobacco thrips on cotton, although this species was destructive last year.

Texas. R. W. Moreland (May 28): In Brazos and Burleson Counties considerable injury has been caused by thrips, but cotton is overcoming this injury.

FOREST AND SHADE-TREE INSECTS

CANKERWORMS (Geometridae)

Maine. H. B. Peirson (May 15): Spring cankerworm (Paleacrita vernata Peck) is abundant in Kennebunkport.

New Jersey. C. W. Collins (May 24): Although cankerworms are generally much less abundant in the vicinity of Morristown than for the last few years, defoliation of elm and ash by the fall cankerworm (Alsophila pomotaria Harr.) in Chatham and Florham Park has been reported.

New York. J. V. Schaffner, Jr. (May 23): In Nassau and Westchester Counties the fall cankerworm is very common. Severe defoliation on several trees in one locality along the Hutchinson River Parkway was noticed. Considerable control work is being done in both counties.

Pennsylvania. E. J. Udine (May 21): Unusual numbers of spring cankerworms are defoliating basswood and oak at Newville, Cumberland County.

Ohio. T. H. Parks (May 21): The spring cankerworm is again injurious in about 28 western Ohio counties. Complete defoliation has occurred on some unsprayed farmyard apple trees and on elms along stream banks and in certain areas where the infestation is heaviest. At Columbus the insect has not caused severe injury but has increased perceptibly during the last year. In the wooded areas, hickories, ash, hackberry, and a few other forest trees show the effects of feeding by other species of spanworms.

J. N. Knull (May 30): Many of the deciduous trees in the section around Clifton have been badly defoliated by cankerworms.

Indiana. J. J. Davis (May 23): Spring cankerworm has been unusually abundant from near Indianapolis, in the center of the State, to the northern tier of counties. The first reports came in on May 7 and frequent reports have been received since. Each year for the last 4, the reports of cankerworm abundance have noted increasing infestation and spread. The following report on May 14 from Wabash is typical. The reporter recorded the first appearance of the cankerworms on the elms in one corner of his timber acreage 4 years ago. They gradually spread until this year they have defoliated all elms in the entire area and are going over to other trees. The elms stripped of foliage 4 years ago are nearly all dead.

Illinois. W. P. Flint (May 23): Spotted damage has occurred over the northern two-thirds of Illinois, with the most severe damage in the northwest third of the State. The damage is very spotted, a few cities having almost all trees infested and other cities and towns within probably 25 miles showing practically no injury. Single pieces of woodland or small areas of woodland along streams have been severely

damaged, while $\frac{1}{2}$ mile away little damage had occurred.

Kentucky. W. A. Price (May 28): Cankerworms defoliated elm trees in the vicinity of Georgetown and Paris.

Michigan. R. Hutson (May 26): Spring cankerworms are very numerous at Shelby, Swartz Creek, Mount Clemens, Ionia, Owosso, Corunna, and Lansing.

Iowa. H. E. Jaques (May 25): Many orchards and a large number of elms in home plantings, as well as in the woods, have suffered severely throughout southeastern Iowa from the heavy infestation of cankerworms. While both spring and fall cankerworms are involved, our examinations indicate that the spring cankerworm is much more abundant. Many neglected orchards, as well as elm trees, are now wholly defoliated.

Missouri. L. Haseman (May 23): Spring cankerworm infestation reported a month ago has passed the peak of development. Reports indicate that it has been pretty general throughout the State but apparently central Missouri has been more severely infested than other parts. Many elm and hackberry trees at Columbia have been practically denuded of foliage.

Nebraska. M. H. Swenk (May 20): The outstanding shade tree pest in Nebraska was the spring cankerworm. Elm, hackberry, apple, and other shade and fruit trees, and, in one instance, grapevines were the subjects of injury. Complaints of injury began coming in on April 27, and have continued to date.

Kansas. J. R. Horton (May 3): Spring cankerworms occurred in outbreak numbers during the last week of March. Injury is most noticeable on elms where the ragged condition of the leaves is becoming evident.

H. B. Hungerford (May 23): Spring cankerworms are doing considerable damage in some sections of Lawrence, and some orchards in the vicinity have been completely defoliated.

H. R. Bryson (May 28): Cankerworms have caused considerable damage to elms and apple trees in various localities in eastern Kansas. The infestations are spotted and local.

Oklahoma. F. A. Fenton (May 20): The spring cankerworm is reported on apples at Bixby.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Connecticut. W. E. Britton (May 21): A few larvae about half grown were reported feeding on linden at New Haven. I have observed one colony feeding upon Rosa hugonis in my garden. A few caterpillars have been seen in other parts of Connecticut.

New England. E. P. Felt (May 24): Forest tent caterpillars occur in small

numbers in southern Connecticut, and in variable numbers further north along the Connecticut River Valley, from Northampton, Mass., to Hanover, N. H. There is a somewhat general infestation, the caterpillars being extremely abundant in parts of New Hampshire and adjacent Vermont, with a probability of extensive defoliation of sugar maples in unsprayed areas.

New York. J. V. Schaffner, Jr. (May 12): Forest tent caterpillars are abundant in many localities in Broome and Delaware Counties. Several woodland areas and sugar orchards are seriously infested.

Michigan. R. Hutson (May 26): Very numerous in the vicinity of Hale, in Iosco County.

Utah. G. F. Knowlton (May 16): This insect is damaging apple foliage in one orchard at Logan.

WESTERN TENT CATERPILLAR (Malacosoma pluvialis Dyar)

Washington. M. H. Hatch (May 23): A great abundance of these caterpillars is reported between Seattle and Everett and on southern Whidby Island, alder, apple, and cherry trees being stripped.

EIGHT-SPOTTED FORESTER (Alypia octomaculata F.)

Kansas. H. B. Hungerford (May 23): This pest is more abundant in the State than I have seen it in a number of years.

GYPSY MOTH (Porthetria dispar L.)

Maine. H. B. Peirson (May 15): Heavy hatching of these caterpillars in Augusta and Gardiner, south-central Maine, has occurred. Complaints are being received of their spinning down onto houses.

Massachusetts. H. L. Blaisdell (April 29): A number of egg clusters were reported in Russell, where caterpillars were hatching about 10 days earlier than last season.

Connecticut. H. L. Blaisdell (April 29): A few caterpillars were reported as hatching in Canaan.

Pennsylvania. H. L. Blaisdell (April 29): Larvae found hatching on a fruit tree in Inkermann on April 18. Additional hatching records received later in the week from an infested area in the Susquehanna Valley. Some infestation found in 20 townships. Nearly 90 percent of the egg clusters located in those within the generally infested area, at Plains, Jenkins, Pittston, and Spring Brook.

ASH

A SAWFLY (Tomostethus multicinctus Rohw.)

Virginia. C. R. Willey (May 11): On April 20 a report was received of sawflies defoliating ash trees several miles down the Mattaponi River from Ayletts. The pest had defoliated the ash trees on this place for several seasons and adults were now swarming around the trees. By May 11 the larvae had defoliated unsprayed trees and had pupated.

A PLANT BUG (Neoborus amoenus Reut.)

Indiana. J. J. Davis (May 23): A plant bug was reported damaging the terminal leaves of ash twigs at Clayton, Danville, and Noblesville on May 13 and 14, all located in the central part of the State.

Ohio. R. H. Davidson (May 11): This plant bug is doing considerable damage to ash in the vicinity of Columbus.

BEECH

BEECH SCALE (Cryptococcus fagi Baer.)

Maine. H. B. Peirson (May 1): A great increase in the intensity of the outbreak of beech scale in Washington and Hancock Counties, with considerable dying of the trees, has been noted.

BIRCH

BRONZED BIRCH BORER (Agrilus anxius Gory)

Maine. H. B. Peirson (May 1): Practically all ornamental white birch in cities in the southern third of the State has been destroyed or is dying from attacks of this insect.

Iowa. C. J. Drake (May 27): This insect is seriously damaging birch trees in Leon, Decatur County. The adults are now emerging in fairly large numbers in the city.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Connecticut. W. E. Britton (May 21): Overwintering adults have been received from Plantsville, Vernon Center, and two lots from East Hartford.

Kentucky. W. A. Price (May 28): Elm leaf beetles are numerous in the vicinity of Lexington, where eggs began hatching about May 5.

California. C. S. Morley (May 11): This beetle is showing up and doing

some damage to the elm trees in Kern County.

SMALLER EUROPEAN ELM BARK BEETLE (Scolytus multistriatus Marsham)

Ohio. A. Johnson (April 22): Fragments of beetles taken from woodwork in a newly constructed house at Youngstown. (Det. by M. W. Blackman.)

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Ohio. T. H. Parks (May 24): This insect is causing the usual number of inquiries from residents in Columbus and other cities.

Indiana. J. J. Davis (May 23): Destructively abundant in many regions of the State, particularly in the northern half. Obviously this is a pest that must be given considerable attention from now on. It has been gradually spreading and increasing in destructiveness for several years.

Illinois. W. P. Flint (May 23): This scale has been reported from several towns in central and north-central Illinois.

Colorado. G. M. List (May 28): There has been a very low winter mortality and the scales are beginning to attract attention. Many trees in northern Colorado towns will be seriously injured.

A SCALE INSECT (Phenacoccus dearnessi King)

Connecticut. W. E. Britton (May 21): Elm twigs brought in from West Hartford were lightly infested by this insect.

LARCH

LARCH CASEBEARER (Coleophora laricella Hbn.)

Vermont. H. L. Bailey (May 28): This insect was browning the foliage of larch trees. This was generally noticeable in Rutland County on May 19.

Michigan. R. Hutson (May 26): This insect was reported from Rochester, Howell, and Williamston.

LOCUST

LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

Virginia. W. S. Hough (May 23): Reported from Winchester that this insect is appearing in the adult stage in apple orchards.

Alabama. J. M. Robinson (May 19): The locust leaf miner is infesting about 50 percent of the foliage on black locust plantings on the experiment station grounds at Auburn.

MAPLE

MAPLE BORER (Conopia acerni Clem.)

Ohio. R. H. Davidson (May 4): The first adults of the maple borer were collected on this date. A number of silver maples are infested at Columbus.

NORWAY MAPLE APHID (Periphyllus lyropictus Koss.)

Virginia. A. M. Woodside (May 21): This aphid is becoming abundant in Staunton.

WOOLLY ALDER APHID (Prociphilus tessellatus Fitch)

Mississippi. C. Lyle (May 24): Heavy infestations on maple trees were recently observed at State College and Sessums, in Oktibbeha County, and at Harperville, in Scott County.

WOOLLY MAPLE LEAF SCALE (Phenacoccus acericola King)

Georgia. M. Murphey, Jr. (May 24): This insect is very abundant in some locations.

COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Indiana. J. J. Davis (May 23): This insect is very abundant in the northern part of the State.

MAPLE BLADDER GALL (Phyllocoptes quadripes Shim.)

Connecticut. W. E. Britton (May 21): Leaves of silver maple bearing characteristic galls have been received from Hamden, Manchester, New Haven, and Stamford.

OAK

BUCK MOTH (Hemilouca maia Drury)

Texas. R. K. Fletcher (May 23): Caterpillars reported as seriously injuring live oak trees in Calhoun County, on the Gulf coast. This caterpillar is also causing severe skin eruptions to those who come in contact with it. (Det. by C. Heinrich.)

PINE

A SAWFLY (Acantholyda erythrocephala L.)

New Jersey. C. L. Griswold (May 31): First found attacking white pine in Morristown and Somerville in 1936. In 1937 the insect was causing noticeable defoliation on red pine in Oakland Township. Besides the

localities mentioned, I have taken it at Convent, Mahwah, Bernardsville, Springfield, and Mountain View. The first and apparently the only previous record of the species in North America is from Chestnut Hill, Pa., where two males were taken in 1925. (Det. by Grace Sandhouse.)

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

New York. J. V. Schaffner, Jr. (May 20): In Westchester County and on Long Island this pest is very abundant in plantings of Scotch and red pine. Many red pines in plantations and in small ornamental groupings are in a very poor condition, owing to attack by this insect. Full-grown larvae and pupae were noted on May 20.

Michigan. R. Hutson (May 26): Has been reported from Flint, Pontiac, Mount Clemens, and Detroit.

NANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.)

Mississippi. C. Lyle (May 24): Injury to pine at Jackson, in Hinds County, was reported on May 11.

PINE TUBE MOTH (Argyrotaenia pinatubana Kearf.)

New Jersey. J. V. Schaffner, Jr. (May 23): Moths were noted as quite abundant on white pine trees near Mine Brook on April 25. The tubes of last year are very noticeable on the trees.

A LEPIDOPTERON (Battaristis vittella Busck)

Connecticut. G. H. Plumb (May 23): In some cases larvae are causing primary injury to red and mugho pine buds and young shoots; in other instances living in burrows in dead tips killed by larvae of the European pine shoot moth. Found to be widespread in the State.

A WEEVIL (Hylobius radicis Buchanan)

Pennsylvania. E. P. Felt (May 24): Found working in Austrian pine in the Philadelphia area.

A SPITTLEBUG (Aphrophora parallela Say)

Connecticut. G. H. Plumb (May 23): Eggs, probably of this species, laid in the terminal end of red pine buds were observed at New Haven in March. The eggs are inserted between the bud scales, causing a marked swelling of that portion of the bud. Many nymphs emerged from collected buds but failed to take on mugho pine to which some of them were transferred.

PITCH TWIG MOTH (Petrova comstockiana Fern.)

New York. J. V. Schaffner, Jr. (May 23): Throughout the pitch pine areas

on Long Island there is a general infestation of this moth. In some localities individual trees or small groups of trees are heavily infested.

SPRUCE

SPRUCE APHID (Aphis abietiana Walk.)

Washington. W. W. Baker (May 9): Abundant in Colorado Blue, Sitka, and Engelmann spruce on Veteran's Hospital Grounds, American Lake.

SYCAMORE

A SCALE INSECT (Stomacoccus platani Ferris)

California. P. Simmons (May 10): This species has been troublesome in Fresno for 3 or 4 years, causing spotting and falling of the leaves of ornamental sycamores, probably the commonest street trees in Fresno. On the above date the insects were massed under loose bark and were beginning to cause yellowish spots on the leaves.

SYCAMORE LACEBUG (Corythucha ciliata Say)

Ohio. R. H. Davidson (May 12): Lacebugs are doing considerable damage to sycamore trees in the vicinity of Columbus.

California. C. S. Morley (May 11): A report from Kern County states that lacewing tingids have been numerous and are feeding on native sycamore and balm-of-Gilead trees.

INSECTS AFFECTING GREENHOUSE AND ORNAMENTAL PLANTS

THRIPS (Thysanoptera)

Virginia. H. G. Walker and L. D. Anderson (May 25): Certain varieties of roses at Norfolk have been rather heavily infested with thrips, the thrips crawling inside the buds and causing them to turn brown and die without opening. The same type of injury also occurred on peonies.

Maryland. E. N. Cory (May 24): Thrips are doing considerable damage to light-colored roses.

Florida. J. R. Watson (May 23): Thrips, including the flower thrips (Frankliniella tritici Fitch) on roses and other flowers, have been unusually injurious, owing to the unusually hot and dry weather of the last month.

Mississippi. C. Lyle (May 24): G. L. Bond, of Moss Point, reported observing several heavy infestations of thrips on roses and some light infestations on gladiolus on May 18. H. Gladney reported on May 21 that thrips were very numerous in and doing considerable damage to blossoms of Cape-jasmine in Harrison County.

ROSE LEAF BEETLE (Nodonota puncticollis Say)

Maryland. E. N. Cory (May 24): Reported as being generally prevalent on roses.

Virginia. J. E. Beard (May 25): Reported from Fairfax on peony, rose, and grape. A vast number were brought in on a peony flower.

A BUPRESTID (Agrilus coeruleus Rossi)

Ohio. J. N. Knull (May 28): Numerous adults were found feeding on the foliage of honeysuckle (Lonicera sp.) at Columbus.

A BEE (Colletes rufithorax Smith)

District of Columbia. E. A. Back (May 12): Adults flying in large numbers over lawn in the northwestern part of the city and burrowing in soil-filled grass with unsightly mounds of fresh soil. (Det. by G. A. Sandhouse.)

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. C. D. Lebert (May 26): Six small infestations on ornamentals were controlled during the period May 1 to 20. The host plants were euonymus, privet, and oleanders in yard plantings. This completed the survey over all former infestations found in Phoenix and Salt River Valley in the last 3 years, and all surrounding properties.

A LACEBUG (Corythucha cydoniae Fitch)

Mississippi. C. Lyle (May 24): Specimens were received from Waynesboro on May 5, with a report that these insects were heavily infesting shrubs.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

South Dakota. H. C. Severin (May 20): This scale passed the winter successfully in eastern South Dakota and is abundant in many areas.

GREENHOUSE STONE CRICKET (Tachycines asynamorous Adel.)

North Dakota. J. A. Munro (June 1): This cricket has become a serious pest in our greenhouses in the Fargo area. It is particularly troublesome on young flax seedlings but also attacks a variety of greenhouse vegetation.

ARBORVITAE

ARBORVITAE LEAF MINER (Argyresthia thuiella Pack.)

Connecticut. W. E. Britton (May 21): Injured twigs were received from Bridgeport and two lots from Hamden.

Virginia. W. J. Schoene (May 23): This leaf miner was observed causing injury to arborvitae plants at Cliffview. This injury is comparatively rare.

ARBORVITAE APHID (Lachnus thujafilina Del G.)

Virginia. H. G. Walker and L. D. Anderson (May 25): Specimens of what appeared to be the arborvitae aphid were received from the Eastern Shore of Virginia with the notation that they were doing considerable damage in a planting of young pines.

Mississippi. C. Lyle (May 24): Infested arborvitae twigs were received from Kilmichael, in Montgomery County, on May 7.

Oklahoma. F. A. Fenton (May 20): This aphid was reported from Stillwater and Edmond.

BOXWOOD

BOXWOOD LEAF MINER (Monarthropalpus buxi Laboulb.)

Virginia. C. R. Willey (April 20): A few had emerged on April 20, emergence apparently having begun on the 18th at Richmond.

H. G. Walker and L. D. Anderson (May 25): This leaf miner was reported as being rather abundant in several plantings of boxwood in Norfolk.

CEDAR

A LEAF MINER (Argyresthia freyella Wlsm.)

New York. E. P. Felt (May 24): This insect was found infesting red cedar rather abundantly. Specimens were received from Amityville, Long Island.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Florida. J. R. Watson (May 23): Thrips, including the gladiolus thrips, have been unusually injurious, owing to the unusually hot, dry weather of the last month.

Indiana. J. J. Davis (May 23): Gladiolus thrips were reported destroying a large acreage of gladiolus at Bedford on May 18. The flower spikes sent in were already damaged considerably and in another week will be worthless.

HOLLY

HOLLY LEAF MINER (Phytomyza ilicicola Loew)

Connecticut. W. E. Britton (May 21): Two lots of mined leaves have been received from Bridgeport.

E. P. Felt (May 23): The holly leaf miner was reported from Wilton.

Virginia. C. R. Willey (April): On March 11 larvae and pupae were present in leaves collected. On March 19 all of forty-odd specimens taken from leaves brought to the office had pupated. On April 10, in leaves examined on tree and on the ground in a park in Richmond, 100 percent were pupae. By April 19 they were apparently 100-percent emerged and many flies were on the leaves of the new growth.

Kentucky. W. A. Price (May 28): Adults were found in the Lexington area on May 3.

HOLLY BUDMOTH (Rhopobota naevana ilicifoliana Kearf.)

Oregon. D. C. Mote (May): Emerging and eggs hatching at Astoria on May 9. Eggs and larvae present. Normal injury to holly buds.

LILAC

LILAC LEAF MINER (Gracilaria syringella F.)

Oregon. D. C. Mote (May): Present in the Willamette Valley, commonly causing blotch mines on lilacs. Adults and larvae present, the adults emerging late in March and early in May.

NARCISSUS

A MOTH (Xanthopastis timais Cram.)

Mississippi. C. Lyle (May 24): Severe injury to lily and narcissus plants was reported from Liberty in Anite County on May 19.

OLEANDER

POLKA-DOT WASP MOTH (Syntomeida epilais jucundissima Dyar)

Florida. H. T. Fernald (May): Adults have not been abundant until very recently but now are quite common in the center of the State.

PRIVET

WHITE PEACH SCALE (Aulacaspis pentagona Targ.)

Maryland. C. A. Weigel (May 3): Limbs rather heavily encrusted with this scale causing death of worst infested twigs and branches on a privet hedge at Beltsville. (Det. by H. Morrison.)

Virginia. H. G. Walker and L. D. Anderson (May 25): The white peach scale has been observed rather heavily infesting catalpa, mulberry, and privet at Norfolk.

ROSE

APHIDS (Aphidae)

Massachusetts. A. I. Bourne (May 24): Such shrubs as roses and spiraea were showing a heavy infestation of aphids as early as May 10, unusually early for such a heavy infestation.

Utah. G. F. Knowlton (May 20): The potato aphid (Illinoia solanifolii Ashm.) is present and maturing upon but not yet injuring rose bushes at Salt Lake City and Cottonwood.

California. P. Simmons (May 10): General reports indicate that aphids on rose bushes and other ornamentals in home plantings at Fresno are much more abundant than last spring, when they were abnormally scarce.

ROSE SAWFLY (Caliroa aethiops F.)

Kansas. H. B. Hungerford (May 23): Rose slugs are doing more damage in the State than usual.

ROSE CURCULIO (Rhynchites bicolor F.)

Utah. G. F. Knowlton (May 27): These beetles are abundant on rose bushes examined at Salt Lake and Lehi.

SNOWBALL

SNOWBALL APHID (Anuraphis viburnicola Gill.)

Michigan. E. I. McDaniel (May 9): We received today a batch of viburnum leaves infested with this aphid. This is especially interesting because the aphid is some 30 days early this season.

Colorado. G. M. List (May 28): The snowball aphid is more injurious in northern Colorado than for a number of seasons. Only a few blossoms will open normally.

Utah. G. F. Knowlton (May 17): Two species of aphids, the snowball aphid and the bean aphid (Aphis rumicis L.) are damaging snowball flowers and foliage at Orderville. (May 27): Black aphids are curling leaves and injuring blossoms of snowballs at American Fork and Lehi.

YEW

BLACK VINE WEEVIL (Brachyrhinus sulcatus F.)

Ohio. R. H. Davidson (May 13): On April 20 a number of larvae were reported attacking yew and causing serious damage near Steubenville. Some were collected and reared to adults, the first of which emerged on May 2. They proved to be the black vine weevil.

I N S E C T S A T T A C K I N G M A N A N D
D O M E S T I C A N I M A L S

MAN

MOSQUITOES (Culicinae)

Oregon. H. H. Stage (May 21): The first migration of mosquitoes, Aedes aldrichi D. & K. and A. vexans Meig., into the residential section was observed on the evening of May 20, the warmest day to date. This brood was hatched by the Columbia River freshet which reached a height of 15.9 feet on May 5.

BUFFALO GNATS (Prosimulium hirtipes Fries)

Massachusetts. C. N. Smith (May 9): A species of Simuliidae has been causing considerable annoyance to persons in Chilmark, on Martha's Vineyard Island. Since about the first of May the flies have been abundant on warm mornings, causing great discomfort to outdoor workers by their bites. (Det. by A. Stone.)

RABBIT FLEA (Hoplopyllus affinis Baker)

Iowa. C. J. Drake (May 27): Specimens of the common rabbit flea have been received from Hawarden, Sioux County, where a house was badly infested.

THRIPS (Thysanoptera)

California. R. E. Campbell (May 24): In one section of Alhambra, in the southern part of the State, where there are a number of vacant lots, an unidentified thrips began migration in great numbers from the vegetation as it dried up. The thrips invaded houses and caused considerable mental anguish to the householders.

TROPICAL RAT FLEA (Liponyssus bacoti Hirst.)

District of Columbia. Mrs. G. W. Cronyn (May 26): Collected in Washington, D. C., where they were biting man. They were taken from a house where mice have been present. (Det. by H. E. Ewing.)

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

Georgia. A. L. Brody (May 19): A case of true screwworms in the ear of a pig was reported from Quitman.

Florida. A. L. Brody (May 19): Specimens of this pest sent from Lee, in Madison County. This is our first authentic record of the presence of this insect in northern Florida this year.

Tennessee. G. M. Bentley (May 25): Screwworm found at Covington, working in a wound on a mule.

Kansas. E. G. Kelly (May 31): Screwworms were removed from a small calf the last week of December in Comanche County. They were also removed from small calves on March 27 in the same county. They were observed in cattle in Barber and Harper Counties in March, and were reported as very abundant, attacking dehorned cattle and newly sheared sheep in Woodson, Wilson, Montgomery, Elk, and Allen Counties. These last reports came in on May 3 and the species have not yet been determined. Last week several cases of screwworms were heard of from Sumner, Harper, and Kingman Counties.

Texas. D. C. Parman (May 25): Up to April 30 screwworm cases had increased markedly and many cases were occurring on the Edwards Plateau and the Southern Escarpment in Texas. Indications are that an outbreak equal to or greater in severity than the serious one in 1935 will occur in 1938 in this area.

Arizona. D. C. Parman (May 25): On April 30 cases appeared to be rather few and scattered, except in the area about Yuma and Nogales. Screw-worm flies, although not yet so numerous as in Texas, are distributed over the State and conditions favor their rapid increase.

SECONDARY SCREWORM (Cochliomyia macellaria F.)

Alabama. J. M. Robinson (May 17): The secondary screwworm was reported on May 2 as being active in dehorned cattle at Selma, and on May 17 at Prattville.

STABLEFLY (Stomoxys calcitrans L.)

Kansas. R. W. Wells and F. C. Bishopp (May 20): In eastern and central Kansas these flies are now sufficiently numerous to cause livestock some annoyance. In a few instances herds were observed to be bunching to fight the flies. The number observed per animal, however, was not large, ranging from 5 to 25.

Texas. E. W. Laake (May 23): Stableflies continue to be numerous and troublesome. On the laboratory premises at Dallas from 8,000 to 10,000 were trapped during the last week.

HORN FLY (Haematobia irritans L.)

Georgia. A. L. Brody (May 19): This species has been exceedingly abundant and annoying to cattle at Valdosta during the last month. The average per animal has been as high as 500 to 700. All the steers on the Government experimental farm showed large injured areas due to the bites of this species.

Kansas. R. W. Wells and F. C. Bishopp (May 20): Horn flies are becoming somewhat troublesome in eastern and central Kansas. They range in number from 10 to 50 per animal. The use of fly sprays on livestock has been started during the last week. This, however, is due to the presence of stableflies, as well as horn flies.

Texas. E. W. Laake (May 23): The horn fly population has built up rapidly during the last month. Infestations of 4,000 flies per head are common on cattle near Fort Worth, while 2,000 per head have been noted on cattle at dairies in the vicinity of Dallas.

GULF COAST TICK (Amblyomma maculatum Koch)

Georgia. A. L. Brody (May 19): Reports are that this species is beginning to appear on steers and sheep at Valdosta. The first specimens were found on these animals on May 5. An increase in numbers was noted on May 12.

HORSE

MOSQUITOES (Culicinae)

Kansas. R. W. Wells and F. C. Bishopp (May 20): Although no mosquitoes are reported as being seen in these localities this spring, cases of equine encephalomyelitis have been reported in both Fort Riley and Topeka. These cases were seen by veterinarians and appeared to be authentically diagnosed, although the animals recovered; therefore no brain examinations were possible.

Utah. G. F. Knowlton (May 20): Mosquitoes are abundant and annoying to man and livestock in the fields west of Springville, in Utah County.

Nevada. G. G. Schweis (May 19): During the season of 1937 mosquitoes caused such annoyance in the Lovelock district that the county and city officials have decided on a control project this year. This control will consist of draining the marshy areas where feasible. Where that type of control is not possible the pools will be treated with oil.

BLACK FLIES (Simulium vittatum Zett.)

Iowa. C. J. Drake (May 18): Flies found biting horses' ears in the vicinity of Adel. Suspected that they were the common species of black fly but requested a determination to be certain. (Det. by A. Stone.)

HORSEFLIES (Tabanidae)

Florida. E. A. Back (April 26): Horsefly (Tabanus trijunctus Walk.) present in swarms in annoying and alarming numbers during midday and early afternoon under sheds and porches of houses, stores, and filling stations at Bonita Springs, in Lee County, and at Naples, in Collier County. Flies did not bite, but buzzed so loudly they were mistaken for wasps by travelers. (Det. by A. Stone.)

Texas. E. W. Laake (May 23): Horseflies have been frequently observed during the last month. One specimen of an undetermined tabanid species was taken in the trap at the laboratory at Dallas. Six specimens of Tabanus atratus F. were caught on cattle at our laboratory and in the cattle-fly trap at the Dallas laboratory during the last week. Also a number of Tabanus lineola F. were taken in the trap at the laboratory.

O. G. Babcock (May 23): On May 21 the first appearance of the horsefly was noted in the southwestern section of the State.

HORSE BOTFLY (Gastrophilus intestinalis Deg.)

Texas. W. G. Bruce and F. C. Bishopp (May 23): A few botflies are active in this vicinity (Dallas), ovipositing on horses and mules. Apparently the flies began oviposition about a week ago.

POULTRY

STICKTIGHT FLEA (Echidnophaga gallinacea Westw.)

Texas. O. G. Babcock (May 20): Isolated reports of ~~severe~~ infestations of the chicken sticktight flea.

FOWL TICK (Argas miniatus Koch)

Texas. O. G. Babcock (May 20): A report from Sonora indicates that the fowl tick is increasing rapidly.

TURKEY GNAT (Simulium meridionale Riley)

Mississippi. G. L. Bond (May 18): These turkey gnats have been quite annoying around wooded swampy areas in southern Mississippi during the last month.

SHEEP AND GOATS

GOAT LICE (Bovicola spp. and Linognathus spp.)

Texas. O. G. Babcock (May 20): These lice are abundant on undipped goats in the vicinity of Sonora, increasing rapidly since shearing. Will be severe in June on undipped goats.

SHEEP BOTFLY (Oestrus ovis L.)

Georgia. A. L. Brody (May 19): Early first-stage larvae were found in the nasal passages of 8 out of 10 goats examined on May 10 at Valdosta.

SHEEP TICK (Melophagus ovinus L.)

Oklahoma. F. A. Fenton (May 20): Reported from Dustin and El Reno.

GREENBOTTLE FLIES (Lucilia sericata Meig.)

Georgia. A. L. Brody (May 19): An infestation of this species around the tail of a white leghorn hen was found on April 29. The hen was recovering from a heavy infestation of this species.

Tennessee. G. M. Bentley (May 16): Reported by one of our inspectors from Union City, Obion County, on sheep.

SHEEP SCAB MITE (Psoroptes communis ovis Hering)

South Dakota. H. C. Severin (May 20): Sheep scab is much more abundant than usual, especially in eastern South Dakota, where many sheep have been brought in during the last few years.

DOG

AMERICAN DOG TICK (Dermacentor variabilis Say)

Massachusetts. C. N. Smith (April 30): Adults of this tick became very abundant during April, from 60 to 90 being removed from individual dogs after the middle of the month. Larvae and nymphs also became active during the month. Reported from Vineyard Haven, Martha's Vineyard Island.

Virginia. H. G. Walker and L. D. Anderson (May 25): Ticks appear to be moderately abundant, as nearly every dog that is not tied up is infested with one or more ticks. Reported from Norfolk.

Georgia. A. L. Brody (May 19): One male was removed from a dog on May 5. H. M. Brundrett reports the presence of males and females of the species on sheep and steers on May 12 near Valdosta.

Iowa. H. O. Schraeder (May 1): Adults of this species became active as early as May 1 in the vicinity of Ames.

R. W. Wells and F. C. Bishopp (May 19): This tick is numerous in the vicinity of Osceola. About 20 specimens were observed on 1 dog and the ticks are removed from this animal about every 3 days. No cases of spotted fever have been reported in this locality this year.

BROWN DOG TICK (Rhipicophalus sanguineus Latr.)

Georgia. A. L. Brody (May 19): Ticks of this species were removed from a dog on May 11 at Valdosta.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

Massachusetts. C. N. Smith (May 9): Two infestations of houses by termites have been reported in Vineyard Haven. In one case the termites had destroyed the entire framework of a basement window which was in contact with the ground. The adjacent studding was also damaged to an undetermined extent. In the other case a swarm of the winged forms issued from the earth wall of a basement, but no damage to the house has yet been discovered. Termites have not heretofore been regarded as a serious problem on Martha's Vineyard, and inquiry reveals only one previous infestation of a building.

Ohio. N. F. Howard (April 19): Termites swarmed unusually early from stumps and roots under the temporary building at the laboratory at Columbus.

Indiana. J. J. Davis (May 23): The number of inquiries concerning termites in the State have been numerous, probably more than last year.

Illinois. W. P. Flint (May 23): About the usual number of reports regarding termite injury have been coming in from over the State.

ANTS (Formicidae)

Mississippi. C. Lyle (May 24): Under date of May 18, G. L. Bond, of Moss Point, wrote as follows: "This species of ant (Solenopsis saevissima var. richteri Forel.) was first reported from Mississippi early in 1935. Evidently it has been present along the eastern border of Jackson and George Counties and in the adjoining section of Alabama for several years. Since 1935 I have watched its spread and find that it occurs over large areas of new territory every year." J. Milton reported on May 23 that fire ants were very numerous in several localities in central Mississippi. Complaints of this species (Solenopsis xyloni McCook) have also been received from Jackson, in Hinds County, and Hattiesburg, in Forrest County.

Louisiana. B. A. Osterberger (May): Specimens of ants taken in rafters of a residence were sent on April 21 to T. E. Snyder for determination. They were determined as Crematogaster sp. near laeviuscula Mayr.

Nebraska. M. H. Swenk (April 29): Complaints of damage or annoyance in houses by ants (Formicidae) were received from Dodge, Douglas, and York Counties on April 25, April 29, and May 2, respectively. The species concerned in the Dodge County report was the common lawn ant (Lasius niger neoniger Emery) and the one reported from York County was the basement ant (Lasius interjectus Mayr). (April 25): Specimens of the large black carpenter ant (Camponotus herculeanus pennsylvanicus Deg.) were taken from a house in Hamilton County, where they were proving annoying.

Oklahoma. F. A. Fenton (May 20): The red harvester ant (Pogonomyrmex barbatus F. Smith) was reported from Comanche.

Oregon. R. L. Furniss (May 20): C. herculeanus modoc Wheeler began swarming in Portland homes about the 15th of April. C. maculatus vicinus Mayr was not reported until May 17. These carpenter ants are serious pests in the Pacific Northwest, where they often mine extensively in structural timbers.

E. A. Back (April 29): An ant, Liometopus occidentalis Emery, has been present for 5 years in considerable numbers in a mausoleum at Ashland and has been worrying the custodian because of the psychological effect on the vault owners. (Det. by M. R. Smith.)

BEEETLES (Coleoptera)

New York. E. A. Back (April 20): Cerambycidae (Gracilia minuta F.) collected in warehouse. Determined by W. S. Fisher, who states that this cerambycid is introduced in articles of commerce from Europe.

District of Columbia. E. A. Back (May 20): Adults of a furniture beetle, Hadrobregmus carinatus Say, reared from maple furniture and a maple ox yoke. All wood, heavily infested, had been protected from the weather for years. Was brought infested from eastern Connecticut in 1937. (May 20-25): The rhizophorid beetle (Pelecotoma flavipes Melsh.) was reared in numbers from the maple ox yoke heavily infested with burrows of H. carinatus.

Florida. E. A. Back (March 29): Many larvae and adults of a furniture beetle, Catorama sp., taken from a winged chair, upholstered in vegetable fiber and covered with cotton fabric, shipped to Washington from Coral Gables, Fla. Upholstering material cut into bits by larvae and cover defaced with exit holes. Owner had had chair during previous residences in Philippine and Hawaiian Islands where Catorama exists. However, Catorama was found by E. A. Back damaging upholstering of furniture in Miami in 1935. (April 25-28): Larvae and adults of the

anobiid beetle, Meogastrallus librinocens Fisher, collected from paper-, cloth-, leather-, and parchment-bound books, both old and new, in libraries at San Antonio and St. Augustine. Infestation severe in both of these localities. At the latter place it was recorded for the first time. A hymenopteron, Heterospilus sp. (det. by C. F. W. Muesebeck) was shaken from a book in St. Augustine and is probably a parasite of M. librinocens, which was heavily infesting the book.

Ohio. J. N. Knull (May 27): Infestations of the powder post beetle (Lyctus planicollis Lec.) in a hardwood floor have been reported from various parts of the State during the last year.

Washington. M. H. Hatch (May 20): L. planicollis has been sent in as injuring furniture at Bellingham and Friday Harbor during the last 2 months. In March 1930 it was reported as injuring pickax handles in Tacoma.

Indiana. J. J. Davis (May 23): Spider beetles (Ptinus fur L.) have been increasingly numerous in the State during April and May. The record of damage is surprisingly low.

Minnesota. A. G. Ruggles and assistants (May 12): Dr. Shepard found about two dozen dead adults of Tribolium madens Charp. clinging to sacks of stored seed corn in a Minneapolis warehouse.

PEA WEEVIL (Bruchus pisorum L.)

Oregon. D. C. Mote (May): This species is present in the adult stage in the Willamette Valley. Emergence was on April 29 and oviposition on May 15.

HOUSE CRICKET (Gryllus domesticus L.)

New Jersey. E. A. Back (May 14): Crickets established in numbers in an oldtype house in Boonville throughout last winter. Apparently established about the furnace, they crawled up the chimney to the unplastered kitchen, where they congregated behind the warm stove in all sizes and caused great annoyance by chirping.

BROWN BANDED COCKROACH (Supella supellectilium Serv.)

District of Columbia. E. A. Back (May 7): All stages found present in an apartment in the northwestern section of Washington. Infestation apparently brought in furnishings from the South several years ago but believed to have been killed out. First record of occurrence in Washington.

GRAND FLY (Tipulidae)

Virginia. C. R. Willey (May 16): A correspondent, of Fort Defiance, sent several dozen specimens on May 7, stating that they were swarming about his place--the lawn, house, trees, and shrubs by millions. They have occurred there for several years but apparently do no damage.

POPULATION AND HOST PREFERENCES OF JUNE BEETLES

IN SOUTHERN WISCONSIN IN 1935, 1936, AND 1937

By T. R. Chamberlin, C. L. Fluke, Lee Seaton, J. A. Callenbach,
and P. O. Ritcher^{1/}

The following is an account of the distribution, flight, habits, and host preferences of species of Phyllophaga in southern Wisconsin,^{2/} based on studies made in 1935, 1936, and 1937. Figure 1 shows the localities in which these studies were conducted. In some of the localities more than one grove was observed.

Studies in 1935

The year 1935 was a year of the flight of the major brood, generally known as "brood A." The first beetle was recorded at Madison on April 26, before work was begun by the Bureau of Entomology and Plant Quarantine. Fairly heavy flights had occurred at Gays Mills by May 12. The spring season was late and the flight prolonged, and heavy flights occurred infrequently on warm nights. Between May 7 and August 7, 49 flights were observed in 14 districts. An area was selected in each district which showed, on general examination, moderate-to-heavy feeding and the presence of a variety of herbs, shrubs, and trees. Groves, largely of bur oaks, showing intense beetle feeding, were avoided because of the scarcity of alternative hosts. Each area was observed from one to many times, as determined by its availability and its value as a collecting ground. Most of the observations were made between 7:30 and 11:30 a.m. Air and soil temperatures were usually recorded at the beginning of the observation period, at the beginning and end of the flights, and at frequent intervals during the observation period.

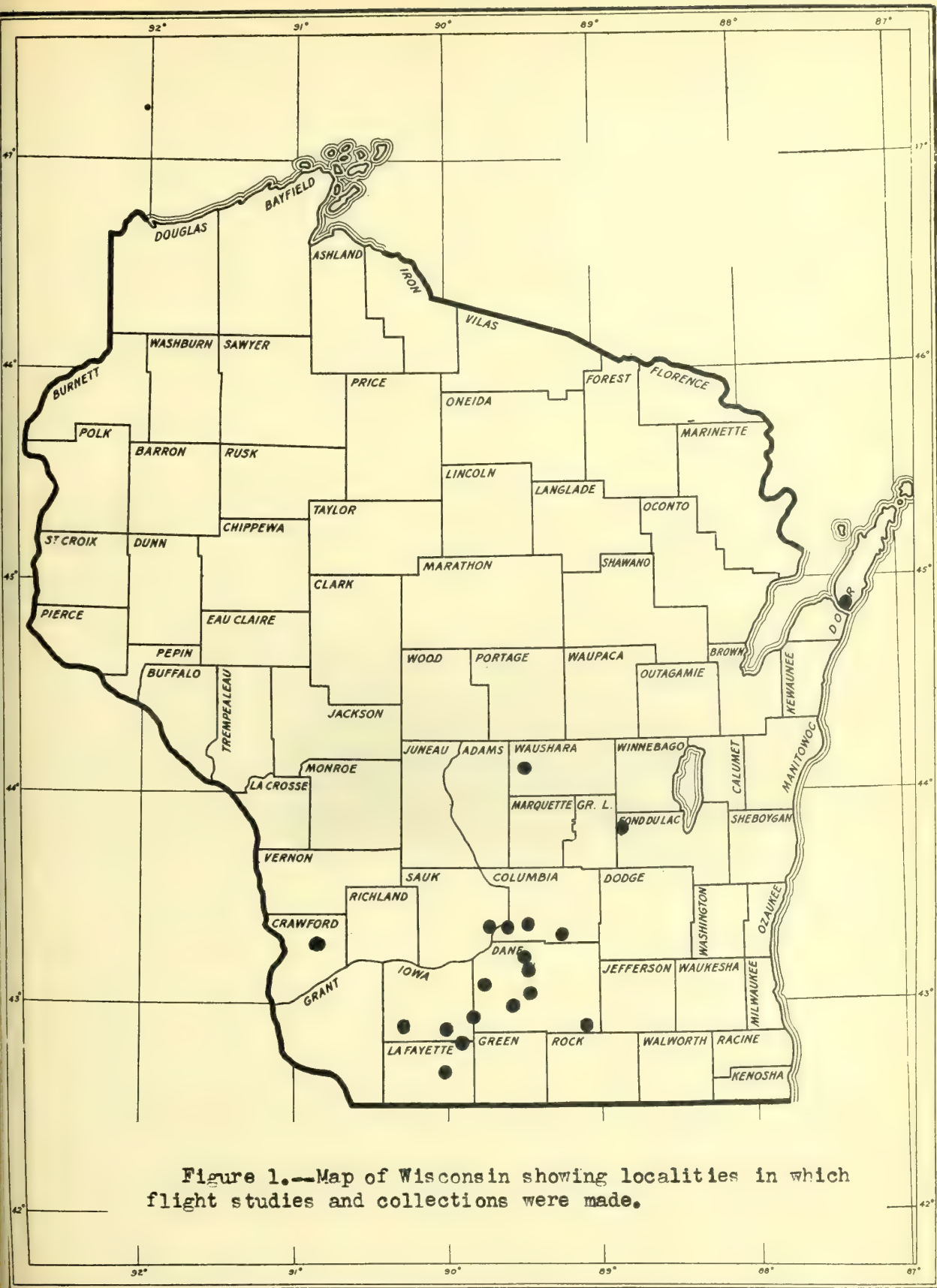
This project is a part of the June beetle investigation being conducted cooperatively by the Division of Cereal and Forage Insect Investigations of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, and the Wisconsin Agricultural Experiment Station through its department of economic entomology. Ritcher made the flight observations at Gays Mills, Wis., in 1935 and Callenbach those in 1936 and 1937. Chamberlin, Fluke, and Seaton made the observations in the other districts for all 3 years.

One locality included, Sturgeon Bay, is not in southern Wisconsin.

The heaviest flights of beetles occurred late in May and early in June and, on occasions during this period, beetles concentrated on some kinds of trees, as bur oak, willow, and hickory, in such numbers that samples could be taken by shaking the branches over canvas. A few of these samples were used in attempts to estimate the proportions of various species present in the locality, but the accuracy of these estimates depended on the accuracy of an assumption (based on general observations) that most of the beetle population of the particular area was concentrated on these hosts. In most cases this assumption probably was correct, but at times temperatures and wind so affected the movements of the beetles as to cause them to be widely scattered over a variety of plants and in such numbers that, had they gone to these trees, they would have altered the proportions of the species actually found there. It seems difficult, therefore, to estimate the relative numbers of species present in a given area from the numbers found on any single host. Where many kinds of host plants are considered there are further complications, as nearly all the beetles can be collected from low-growing plants, whereas a relatively small proportion of the beetles on the taller types is accessible.

The relative tenderness of the leaves appears to influence the selection of hosts by various species of beetles. Bur oak seemed to be the preferred host of Phyllophaga hirticula (Knoch) early in the season but later, when the oak leaves had become tough, hickory was preferred. For a considerable period toward the end of the season P. tristis (F.) was not found in the field, and it was concluded that this species had ceased emerging; but at Ripon Wis., on July 10, large numbers were taken from tender second-growth leaves of bur oaks that had been stripped previously by beetles.

In certain areas beetles fed on species of plants that were not fed upon to any extent in other areas, and this feeding was not dependent on the presence or absence of other hosts. For example, there was in general practically no feeding on boxelder, yet at Gays Mills this host was fed upon, even though other hosts were abundant in the immediate vicinity. Air currents influence the movements of beetles to or from hosts, therefore some beetles may go into the ground in different fields on different mornings and return to different hosts or different sides of the same host on different nights. These habits made it difficult to take any samples closely comparable with others, even in the same area. Temperatures seemed to determine the extent to which beetles fed on low shrubs or trees. On cool nights the beetles did not fly to any extent but issued from the ground and climbed and fed on the nearby shrubs. These observations show that care should be used in attaching much significance to counts made on various plants, no matter how accurate these may be, unless the counting be continued over a long period of time and under a great variety of conditions.



In addition to shaking the limbs of preferred host trees and shrubs over canvas, from two to five collectors picked beetles by hand from all kinds of hosts on which they were found. Attempts were made early in June to devote a definite amount of time to each species of host, but variation in population was found to induce either such dispersion or such concentration of the beetles on their various hosts that the amount of time spent in this way gave a poor idea of host preferences or total populations. After July 1, when beetles became considerably reduced in numbers, an area was entered, its host plants were listed, and all beetles observed within reach were removed from each host. Several persons often collected from different species of hosts simultaneously and often from the same species of host so that the total number of beetles taken should average into figures upon which a fair estimate of the relative abundance of the species of beetles upon certain species of hosts could be based. This method seems to give a definite indication of the relative importance of each species of host in each area as a source of food for the beetles, and for this reason these counts seem particularly valuable.

At present the authors know of no method of estimating accurately the population of the various species of Phyllophaga, based solely on counts of the feeding adults; however, larval counts and counts of adults in the soil made before emergence, in the same areas in which flights are observed, should increase the accuracy of estimates. These additional counts should also be valuable in improving estimates of host preferences.

Flight.---Small flights of beetles occurred when air temperatures were as low as 54° F. One fair-sized flight began at this low temperature near Blue Mounds, Wis., on June 22, 1935, but the soil temperature on this occasion was 60.8°. Air temperatures above 60° are favorable for fairly large flights, and these increased at temperatures of 65° or above. Mating by species other than Phyllophaga tristis was heaviest at 67° to 71°. When, later in the season, higher temperatures occurred, beetles were not so abundant and it could not be determined whether these higher temperatures were more favorable to flight than the lower ones. In May and June many nights were too cold for flight and there were heavy rains which in some cases depressed the temperatures and interfered with flight. Light showers interfered very little with flight, provided the temperatures were high enough. After the first of July temperatures were high enough to permit flight almost every night, but by this time most of the beetles had died.

Population.---A total of 12,053 beetles were taken by hand picking and in a few cases by shaking of branches from determined hosts as given in table 1 which also shows the percentage of the total represented by each species in the collections before July 1, after July 1, and for the entire season. The most abundant species at all times were Phyllophaga rugosa (Melsh.), P. hirticula Knoch, and P. fusca (Froel.), in the order named. P. tristis was fourth in abundance before July 1 but fifth after July 1, and for the whole season was replaced by P. implicita (Horn). These five species made up 98.13 percent of the total number of beetles taken before July 1, 97.90 percent of the total taken after July 1, and 98.09 percent of the total taken during the whole season.

Table 1.--Comparative abundance of various species of

Phyllophaga, brood A, 1935

Species	Before July 1	After July 1	For Season
	Percent	Percent	Percent
<u>P. rugosa</u> (Melsh.)-----	41.26	50.65	42.34
<u>P. hirticula</u> (Knoch)-----	33.75	24.34	32.66
<u>P. fusca</u> (Froel.)-----	18.72	10.50	17.78
<u>P. tristis</u> (F.)-----	2.40	4.44	2.63
<u>P. implicita</u> (Horn)-----	2.00	7.97	2.68
<u>P. balia</u> (Say)-----	.67	.00	.60
<u>P. ilicis</u> (Knoch)-----	.44	.22	.41
<u>P. futilis</u> (Lec.)-----	.26	.00	.23
<u>P. nitida</u> (Lec.)-----	.15	.50	.19
<u>P. anxia</u> (Lec.)-----	.12	.00	.11
<u>P. drakei</u> (Kby.)-----	.10	1.09	.22
<u>P. sprete</u> (Horn)-----	.07	.00	.06
<u>P. prunina</u> (Lec.)-----	.03	.00	.02
<u>P. marginalis</u> (Lec.)-----	.03	.22	.05
<u>P. crenulata</u> (Froel.)-----	.02	.07	.02
Total beetles-----	10,673	1,380	12,053

Host preferences.—In the 14 districts in which host preferences of the beetles were studied, a great variety of host plants occurred, but the number of species of hosts varied considerably in the different districts. For example, only bur oak, aspen, hickory, elm, and sumac occurred in the grove at Madison, whereas at Waunakee these and 16 other species of hosts were present. The districts were as follows: Dane, Waunakee, Madison, Blue Mounds,^{3/} and Verona, in Dane County; Edgerton, in Rock County;^{4/} Blanchardville, in Lafayette County; Sturgeon Bay, in Door County; Ripon, in Fond du Lac County; Merrimack in Sauk County; Mineral Point, Linden, and Hollandale, in Iowa County; and Gays Mills, in Crawford County.

Tables have been made classifying each species according to the host from which it was taken in each collection, but these are too voluminous to be included here. A total of 49 collections from the 14 districts have been consolidated and shown in tables 2 and 3. Table 2 gives all the beetles collected before July 1 and their hosts, and table 3 gives the same for beetles taken after July 1.

It will be noted that there are three entries in most of the spaces in these tables, consisting (reading from the top) of a percentage, a number, and a percentage. The top percentage represents the proportion of the species given at the top of the column which was taken from the host at the left; the number represents the individuals of that species taken from that host; and the lower percentage, the proportion of all individuals of all species found on that host represented by the species at the head of the column. For example, we find in table 2 that 646 individuals of Phyllophaga rugosa were taken from hickory, and that this represented 14.7 percent of the total number of P. rugosa taken and 63.5 percent of the total individuals of all species taken from hickory. Percentages are not shown in cases where they are very low.

Phyllophaga rugosa was taken in all the districts where flight studies were made and, as shown in table 1, it was the most numerous of all species and comprised 42.34 percent of the total beetles taken. It was also the most general feeder and was taken from 35 hosts. It fed heavily on hickory, bur oak, willow, poplar, elm, basswood, and, in the Gays Mills area, on cultivated cherry and boxelder. The first six of the hosts furnished 57.8 percent of the total taken before July 1 and 80.2 percent of the total taken after July 1. None were taken from basswood after July 1.

^{3/} The grove studied was south of Blue Mounds, near the boundary between Dane and Iowa Counties.

^{4/} The grove was north of Edgerton, in Dane County.

Phyllophaga hirticula was also taken in all the localities given, but was very scarce at Gays Mills and not abundant at Madison. Considering the whole of southern Wisconsin, it was next in abundance to P. rugosa and comprised 32.66 percent of the total taken. Although P. hirticula was taken from 22 species of hosts, it does not appear to be so general a feeder as P. rugosa. It fed predominantly on bur oak, hickory, and hazel, those hosts furnishing 85.1 percent of the total taken before July 1 and 74.1 percent of those taken after July 1. It may be noted in the table that hickory furnished 3.9 percent of those taken before July 1 and 51.8 percent of those taken after that date, whereas bur oak furnished 73.8 percent of those taken before July 1 and 3 percent after that date. As stated before, this change in feeding habits seemed to occur while bur oak leaves were becoming tough.

Phyllophaga fusca was also taken in all districts studied. Taking southern Wisconsin as a whole, it was the third species in abundance. It is a rather general feeder and was taken from 25 species of hosts. It fed predominantly on cultivated cherry, bur oak, hickory, hazel, dogwood, poplar, and willow, these hosts furnishing 87.3 percent of the total taken before July 1 and 92.4 percent of the total after that date. It may be noted in comparing tables 2 and 3 that none was taken from cultivated cherry after July 1 and that while only 9.3 percent of the total were taken from dogwood before July 1, 63.4 percent were taken from that host after that date.

Phyllophaga tristis was taken from all districts studied except at Dane and Merrimack. It is, however, known to occur in both places. Considering southern Wisconsin as a whole, it was the fifth species in abundance. It feeds primarily on oak, especially bur oak. Before the first of July 91.8 percent of the total number were taken from bur oak and 3.9 percent from other oaks. After July 1, 82 percent were taken from bur oak and 18 percent from red oaks.

Phyllophaga implicita was fourth in abundance in southern Wisconsin. It was primarily a willow and poplar feeder, but was taken from four other hosts. Before the first of July 86.9 percent of the total were taken from willow and 2.8 percent from poplar. After July 1, 93.6 percent were taken from poplar and 6.4 percent from willow.

Other species.---The remaining 10 species, which together approximated 2 percent of the total, were taken from relatively few hosts. These can be found in tables 2 and 3. Dogwood was the favorite host of Phyllophaga drakei both before and after July 1, and dogwood and hazel were preferred by P. nitida. Most of the P. anxia were taken from willow. The seven specimens of P. spreta were taken from cultivated cherry at Gays Mills.

Any summary such as the foregoing, which gives the total percentages of various beetles collected from different hosts over an entire season, may conceal some of the host preferences because of the variation in population of certain species in different localities. Thus it is possible to collect more specimens of a given species of beetles from an unfavored host, where this species is abundant, than from a favored host where the species is scarce. Much may be gained, therefore, from a careful study of each collection made in each district. It should be emphasized that this was done, and that the estimates of the host preferences and the prevalence of various species based on the individual collections are essentially in agreement with those based on the condensations given in tables 2 and 3.

Table 2.— Beetles of Phyllophaga caught before July 1, 1935

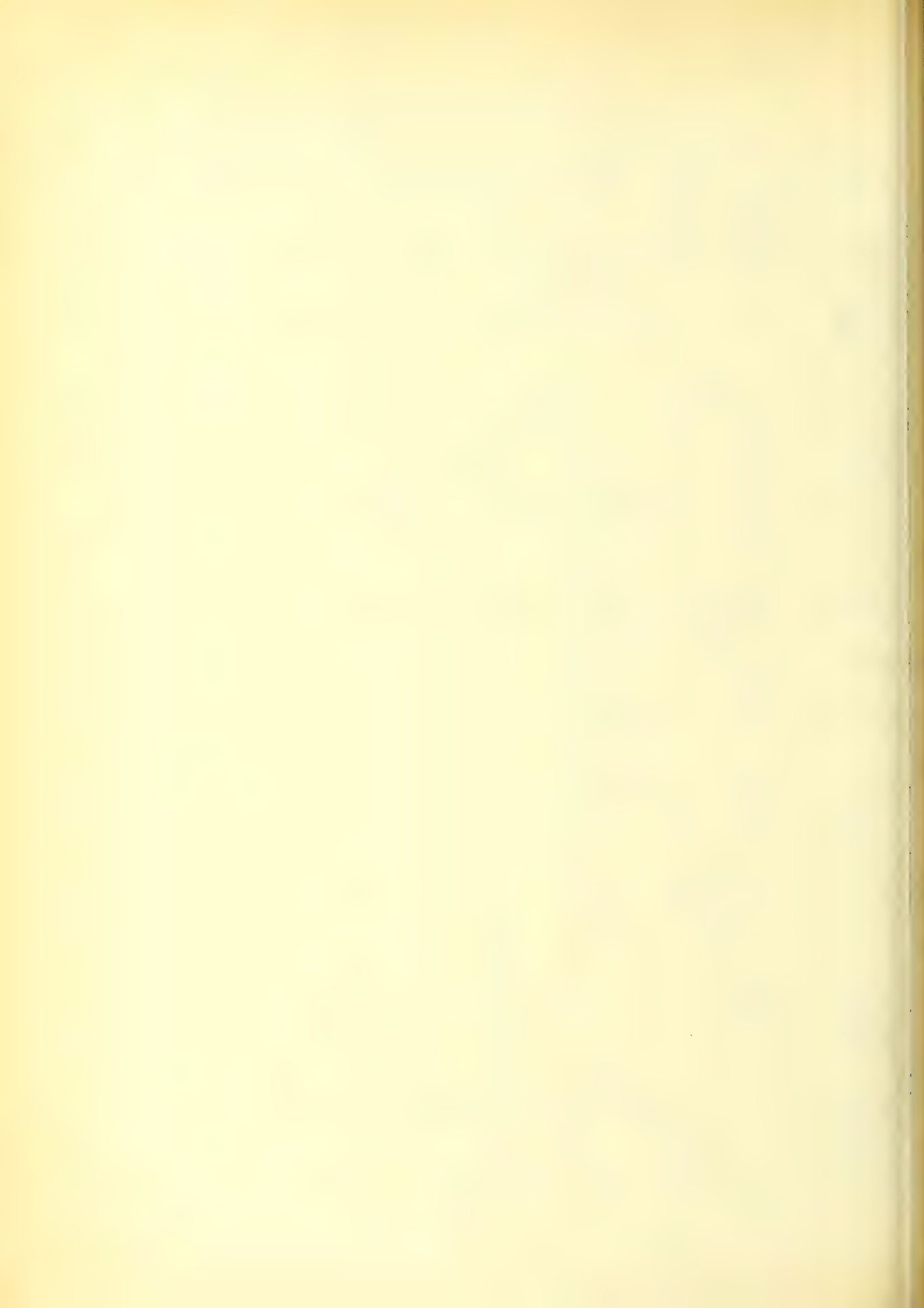
Host	<i>P. rugosa</i>	<i>P. hirticula</i>	<i>P. fusca</i>	<i>P. tristis</i>	<i>P. implicita</i>	<i>P. balia</i>	<i>P. ilicis</i>	<i>P. futilis</i>	<i>P. drakei</i>	<i>P. nitida</i>	<i>P. crenulata</i>	<i>P. prunina</i>	<i>P. auxia</i>	<i>P. spreta</i>	<i>P. marginalis</i>	Total	
	14.7% 646	3.9% 141	10.9% 218	.4% 1		15.3% 11	2.1% 1									101	
Hickory	63.5% 505	13.8% 2655	21.4% 235	.1% 1		1.1% 1	.1% 1									363	
Pur oak	11.5% 505	73.8% 2655	11.8% 235	91.8% 235		1.4% 1		3.6% 1	9.1% 1						33.3% 1		
	13.9% 9	73.0% 26	6.5% 6	6.5% 6		.03% 1		.03% 1	.03% 1						.03% 1		
Red oak	40 59.7% .8%	7 10.4% .8%	12 17.9% .3%	7 10.4% .8%		1.4% 1										6	
White oak	34 72.3% 1.9%	2 4.2% .9%	6 12.7% .5%	2 4.2% .4%		3 6.4% 2.3%										4	
Black oak	85 62.0% 5.6%	34 24.8% 2.9%	9 6.6% 12.3%	1 .7% .4%	5 3.6% 2.8%				9.1% 1			66.7% 2				13	
									.7% 1			1.5% 1					
Populus sp.	249 40.3% 1.7%	107 17.3% .5%	246 39.8% 9.3%	1 .16% 9.3%	6 .97% 9.3%	5.6% .6% 86.9%	2.1% .16% 1.4%	3.6% .16% 1	18.2% .3% 4.2%				7.7% 1		.16%	618	
inc. Aspen	74 25.0% 13.9%	19 6.4% 7.7%	185 62.5% 4.7%						54.5% 6 10	62.5% 10 3.4%						296	
Dogwood	611 66.1% 2.5%	24 2.6% 7.4%	94 10.2% 2.6%	1 .1% .5%	185 20.0% 9.7%	1 .1% 9.7%		31.9% .1% 9.7%	28.6% .1% 9.7%	18.7% 3 6.6%					46.2% 6 7.7%	921	
Willow	110 23.7% 6.2%	268 57.6% 11.2%	52 11.2% 1.6%	1 .2% 7.0%	1 .2% 7.0%	7 8.3% 1.8%	15 3.2% 2.1%	8 1.7% 2.1%								465	
Hazel	273 83.2% 3.7%	1 .3% 2.9%	32 9.8% 2.9%		15 4.6% 2.9%	6 1.4% 1				6.2% 1 .3%						328	
Elm	165 73.0% 1.8%	1 .4% 1.4%	57 25.2% 1			1 .4% 1	2.1% 1 2.1%										226
Butternut	81 60.9% .7%	49 36.8% 2.9%	1 .8% 2.9%			1 .8% 2.1%										133	
Bitternut	30 20.1% .3%	106 71.1% 2.3%	4 2.7% 1					28.6% 8 5.4%							33.3% 1 .7%	149	
Rose	12 12.1% 5.9%	84 84.8% 1.1%	1 1.0% 1.1%		1 1.0% 1.1%							33.3% 1 1.0%				99	
Raspberry	1 100.0%															1	
Gooseberry	2 100.0%															2	
Sumac	2 2.7% 97.5%		2 1.7%			1 .8%										121	
Cultivated Apple	118 97.5%															0	
Sunflower	5.9% 262		3 1.1%				4.2% 2	3.6% 1								268	
Basswood	97.8% 17.6% 776		35.7% 713	2.3% 6		23.6% 17	12.8% 6				50.6% 1		30.8% 4	100.0% 7		1530	
Cultivated cherry	50.7%		46.6%	.4%		1.1%	.4%				.07%		.3%	.5%			

Table 2 (Cont'd).--Beetles of Phyllophaga caught before July 1, 1935

Host	<i>P. rugosa</i>	<i>P. hirticula</i>	<i>P. fusca</i>	<i>P. tristis</i>	<i>P. implicita</i>	<i>P. balia</i>	<i>P. ilicis</i>	<i>P. futilis</i>	<i>P. drakei</i>	<i>P. nitida</i>	<i>P. crenulata</i>	<i>P. prunina</i>	<i>P. anxia</i>	<i>P. spreta</i>	<i>P. marginalis</i>	Total
Walnut	1 50.0% .8%										50.0% 1 50.0%					2
Quack grass	37 100.0%															37
Boxelder	1.8% 78 86.7%		.2% 5 5.6%				12.8% 6 6.7%								33.3% 1 1.1%	90
Wild aster	1 100.0%															1
Ash	1 2.9%		1.7% 34 97.1%													35
Balm of Gilead	.3% 13 61.9%		.3% 6 28.6%			2.8% 2 9.5%										21
Ironwood	.9% 41 61.1%		.5% 10 15.4%			13.9% 10 15.4%	8.5% 4 6.2%									65
Plum	2.3% 103 36.8%	2.7% 96 34.3%	3.5% 69 24.6%	.4% 1 .4%		5.6% 4 1.4%	14.9% 7 2.5%									280
Thorn apple	.9% 42 80.8%		3 5.8%			2.8% 2 3.8%	2.1% 1 1.9%	14.3% 4 7.7%								52
Bittersweet	6 100.0%															6
Blackberry	1 100.0%															1
Birch		3 100.0%														3
Serviceberry		1 100.0%														1
Strawberry		1 100.0%														1
Elderberry			1 100.0%													1
Ivy		1 100.0%														1
Black-eyed Susan	3 42.9%							14.3% 4 57.10%								7
Gum	1 50.0%									6.2% 1 50.0%						2
Wild cherry	2 66.7%			.4% 1 33.3%												3
Wild currant										6.2% 1 100.0%						1
Total	4,404	3,600	1,998	256	213	72	47	28	11	16	2	3	13	7	3	10,673

Table 3.-- Beetles of Phyllophaga caught after July 1, 1935

[illegible]



Studies in 1936

Beetles emerging in 1936 in southern Wisconsin belonged to "brood B". Ordinarily this is the smallest of the three broods, but in certain years, such as 1936, the emergence of Phyllophaga tristis, which has a 2-year cycle, has increased the magnitude of the flight of "brood B" considerably. The methods of study were essentially the same as those used in 1935 and insofar as possible beetles were collected from the same groves. Species of beetles other than P. tristis were scarce in 1936, and it was necessary to examine a great many plants in each locality in order to obtain them in any quantity. All plants in each grove were examined carefully and it is believed that a large proportion of the beetles present were actually collected. The scarcity of beetles did not nullify the value of these collections but in some respects was advantageous, especially in the determination of host preferences, since it was not necessary to omit from our calculations the large numbers of beetles which, in seasons of abundance, cannot be collected or counted.

Flight.—The collection of beetles and the study of flight were hindered by the occurrence of many cool nights, which prevented or retarded the emergence of the beetles. Considering the season as a whole, however, the flight of Phyllophaga tristis was very large. Beetles of this species were found in great numbers in various parts of Dane and Lafayette Counties, and many oaks, stripped or partially stripped by them, were observed in these localities. Damage to oaks was reported from Jefferson and Waushara Counties, and specimens were sent in by county agents and other persons from Pepin, Trempealeau, Vernon, Sauk, and Eau Claire Counties.

The first flight of June beetles was observed on May 6 at Gays Mills, but some beetles were taken from beneath leaves early in April.

It was estimated that over 95 percent of the beetles flying belonged to the species Phyllophaga tristis and that over 95 percent of the beetles of this species fed on oak. The flight of P. tristis continued until the end of June but flight of the other species was practically over by June 10.

Phyllophaga tristis flew freely and mated earlier in the season and at lower temperatures than did the other species. Mating was observed at temperatures as low as 52° F. early in the season, but later this temperature was too low for even a small flight. P. tristis usually began issuing from the soil from 10 to 20 minutes earlier in the evening than did the other species. Early in the season emergence began at about 7:30 p.m., but as the length of the days increased emergence began later. With the exception of that by P. tristis very little mating was observed and that observed occurred late in the season.

Species.—Fourteen species of beetles were collected. The number of individual beetles of each species and the percentage of the total that each species comprised are shown in table 4. Beetles of Phyllophaga tristis occurring on oak, which, as indicated earlier, were more numerous than all the others combined, are not included. Of the additional species, P. rugosa was most abundant and comprised 39.66 percent of the total of 1,021 beetles. P. implicita was second in abundance and comprised 17.24 percent of the total. P. fusca, P. futilis, and P. ilicis, respectively, constituted 9.60, 8.52, and 6.66 percent of the total. Together these five species made up 81.69 percent of the total. P. hirticula, which was second in abundance in 1935, was very scarce and comprised only 0.88 percent of the total. Most of the P. futilis beetles were collected at Lamont and most of the P. ilicis beetles at Gays Mills. P. spreta and P. prunina, which were taken in small numbers in 1935, were not obtained in 1936.

Host Preferences. -- Table 5 represents a consolidation of all collections made in 1936 and shows the host plants of the various species of beetles and the percentage of the total of each species found on each host, as well as the percentage of the total beetles represented by each species. Phyllophaga tristis beetles on oak, which were many times as numerous as all other species on all hosts, are not included. It should be noted in this table that some species of host plants have been grouped, for example, "poplars except aspen" and "red oak group." On an actual species basis, therefore, the number of host plants would be greater than that indicated.

Table 4. Adults of Phyllophaga Collected in 1936
by species and the percentage of the total
represented by each species

Species	Beetles Number	Percentage of total
<u>P. rugosa</u> -----	405	39.66
<u>P. implicita</u> -----	176	17.24
<u>P. fusca</u> -----	98	9.60
<u>P. tristis</u> ^{1/} -----	90	8.81
<u>P. futilis</u> -----	87	8.52
<u>P. ilicis</u> -----	68	6.66
<u>P. nitida</u> -----	44	4.31
<u>P. drakei</u> -----	26	2.55
<u>P. hirticula</u> -----	9	.88
<u>P. balia</u> -----	6	.59
<u>P. marginalis</u> -----	6	.59
<u>P. inversa</u> (Horn)-----	3	.29
<u>P. anxia</u> -----	2	.20
<u>P. crenulata</u> -----	1	.10
Total-----	1,021	100.00

^{1/}P. tristis beetles on oak not included.

During the season 34 flights were observed in 10 areas as follows: Gays Mills, Crawford County, 16 flights; Black Earth, Dane County, 2 flights; Dane, Dane County, 2 flights; Waunakee, Dane County, 2 flights; Lamont, Lafayette County, 4 flights; Edgerton,^{5/} Rock County, 3 flights; Blue Mounds,^{6/} Dane County, 2 flights; Madison (Lake Forest), Dane County, 1 flight; Madison (Gregg Farm), 1 flight; Hancock, Waushara County, 1 flight.

Phyllophaga rugosa was, relatively speaking, common except at Lamont. According to the classification of the table, it was taken from 21 kinds of host plants. It fed predominantly on cultivated cherry, dogwood, aspen, basswood (linden), white oak, oaks of the red oak group, bur oak, and ironwood, these host plants furnishing 26.91, 9.38, 8.40, 8.15, 7.90, 7.16, 5.93, and 5.68 percent, respectively, and together 79.51 percent of the total. The cultivated cherries, upon which many beetles were found, are at Gays Mills in a commercial planting. Leaving out of consideration for the moment this host, the diversified feeding habits of P. rugosa become apparent, for the maximum percentage from any other host plant was 9.38 percent, from dogwood.

Phyllophaga implicita occurred in all the areas studied and was taken from eight different host plants, willow, aspen, and other species of poplar furnishing 94.32 percent of the total.

Phyllophaga fusca was taken from 15 kinds of plants, butternut, aspen, dogwood, and oaks of the red oak group supplying 26.53, 23.47, 17.35, and 10.20 percent, respectively, and together 77.55 percent of the total.

Phyllophaga futilis was taken from 12 species of host plants, mostly at Lamont. Prickly ash^{7/} supplied 35.63 percent of the total. This host, together with plum, locust, elm, aspen, and hazel, yielded 83.9 percent of the total. Only 6.9 percent of the total was taken from oaks, although these were common in the areas where P. futilis occurred.

The number of Phyllophaga tristis beetles collected from hosts other than oak was very small in comparison with the number observed on the oaks, but 19 species of host plants other than oaks were recorded. Some preference appeared to be shown for birch, dogwood, and aspen.

Studies in 1937

Methods of study in 1937 were essentially the same as those used in 1935 and 1936; however, some of the groves previously used were not suitable for collection in 1937. These were abandoned and others were selected. In the emergence of "brood C" of beetles in 1937, all species, as compared with 1935, were scarce, with the exception of Phyllophaga hirticula, which is normally abundant in this brood in Lafayette and Iowa Counties. On the other hand, all species, with the exception of P. tristis, were more abundant in 1937 than in 1936. In 1938 the flight will be a major one for all species, including P. tristis.

^{5/}The grove studied was north of Edgerton, in Dane County.

^{6/}The grove studied was south of Blue Mounds, near the border of Iowa County.

^{7/}Xanthoxylum americanum.

Table 5.--Beetles of Phyllophaga collected from host plants, 1936 (P. tristis from oaks not included)

Host plants	P. rugosa	P. implicita	P. fusca	P. tristis	P. futilis	P. 4- filiis	P. nitida	P. drakei	P. birticula	P. balia	P. marginalis	P. leversa	P. axia	P. crenulata	Total beetles	Percentage of total beetles on host
Willow	4.44% 18 14.06%	59.09% 104 81.25%	1.02% 1 .78%	3.33% 3 2.34%			2.27% 1 .78%						50% 1 .78%		128 99.99%	12.54
Aspen	8.40% 34 28.33%	19.89% 35 29.17%	23.47% 23 1.02%	12.22% 11 9.17%	6.90% 6 5.00%	5.88% 4 7.33%	2.27% 1 .83%	23.08% 6 5.00%							120 100%	11.75
Cherry (Cult.)	26.91% 109 95.61%	.57% 1 .88%	1.02% 1 .88%	3.33% 3 2.63%											114 100%	11.17
Hazel	3.95% 16 16.84%		2.04% 2 2.11%	6.67% 6 6.32%	6.90% 6 6.32%	58.82% 40 42.11%	40.91% 18 18.95%	23.08% 6 6.32%				33.33% 1 1.05%			95 100.02%	9.30
Yewwood	9.38% 38 43.67%		17.35% 17 19.54%	13.33% 12 13.79%	3.45% 3 3.45%		22.73% 10 11.49%	26.92% 7 8.05%							87 99.99%	8.52
Butternut	4.44% 18 31.58%		26.53% 26 45.61%	5.56% 5 8.77%		10.29% 7 12.28%	2.27% 1 1.75%								57 99.99%	5.58
Red oak group	7.16% 29 52.73%		10.20% 10 18.18%		5.75% 5 9.09%		13.64% 6 10.91%	3.85% 1 1.82%			33.33% 2 3.64%	33.33% 1 1.82%		100% 1 1.82%	55 100.01%	5.39
Bar oak	5.93% 24 54.55%		6.12% 6 13.64%		1.15% 1 2.27%		10.91% 3 6.82%	11.54% 7 15.91%		16.67% 1 2.27%	33.33% 2 4.55%				44 100.01%	4.31
Blackwood	8.15% 33 80.49%			1.11% 1 2.44%		5.88% 4 9.76%	6.82% 3 7.32%								41 100.01%	4.02
Prickly ash				10.00% 9 22.5%	35.63% 31 77.5%										40 100%	3.93
Hickory	3.95% 16 42.11%		6.12% 6 15.79%	4.44% 4 10.53%		11.76% 8 21.05%				50.00% 3 7.89%	33.33% 1 2.63%				38 100%	3.72
White oak	7.90% 32 86.49%	.57% 1 2.70%	1.02% 1 2.70%			4.41% 3 8.11%									37 100%	3.62
Poplar (except aspen)	.99% 4 11.76%	15.34% 27 79.41%	1.02% 1 2.94%	2.22% 2 5.88%											34 99.99%	3.33
Ironwood	5.68% 23 76.67%	.57% 1 3.33%	2.22% 2 6.66%			2.94% 2 6.66%	4.55% 2 6.66%								30 99.98%	2.94
Elm	.49% 2 9.09%	3.41% 6 27.27%	1.02% 1 4.55%	2.22% 2 9.09%	10.34% 9 40.91%		2.27% 1 4.55%	3.85% 1 4.55%							22 100.01%	2.15
Plum	.25% 1 5%		1.02% 1 5%	3.33% 3 15%	17.78% 16 80%		2.27% 1 5%		22.22% 2 10%						20 100%	1.96
Birch										33.33% 2 10%	33.33% 2 10%				20 100%	1.96
Raspberry	.25% 1 11.11%			4.44% 3 44.44%	3.45% 3 33.33%		3.85% 1 11.11%								9 99.99%	.88
Locust															9 100%	.88
Apple (Cult.)		.57% 1 20%		4.44% 4 80%											5 100%	.49
Walnut				1.11% 1 33.33%	1.15% 1 33.33%								50% 1 33.33%		3 99.99%	.29
Crataegus	.74% 3 100%														3 100%	.29
Sunflower	.25% 1 50%			1.11% 1 50%											2 100%	.2
Rose			1.02% 1 50%					3.85% 1 50%							2 100%	.2
Gooseberry				1.11% 1 50%	1.15% 1 50%										2 100%	.2
Cherry, wild			1.02% 1 100%												1 100%	.1
Sumac	.25% 1 100%														1 100%	.1
Dogbane	.25% 1 100%														1 100%	.1
Boxelder	.25% 1 100%														1 100%	.1
Total	100.01% 405 39.67%	100.01% 176 17.24%	99.99% 98 9.60%	99.97% 90 8.81%	100% 87 8.52%	99.98% 68 6.66%	100% 44 4.31%	100.02% 26 2.55%	100% 9 .88%	100% 6 .59%	99.99% 6 .59%	99.99% 3 .29%	100% 2 .2%	100% 1 .1%	1021 100.01%	100.02



Flight.---Observations on emergence and flight of the beetles agreed essentially with those made in 1935 and 1936. Phyllophaga tristis emerged from 10 to 15 minutes earlier in the evening than did the other species and began flight and mating earlier in the season. P. fusca also began emergence earlier in the season but mated later. P. ilicis appeared late; was found mating but rarely until late in the season; and, as indicated in rearing cages, began oviposition later than other species. Small flights occurred at temperatures in the low 50's but major flights occurred in the 60's and 70's.

There was considerable variation in the duration of the flight period. On some nights the main emergence and flight to host plants was completed within about 5 minutes and on other nights emergence and flight continued slowly but more or less evenly for almost an hour. Soil and air temperatures and wind conditions, as recorded by us, do not explain this behavior.

Species.---Phyllophaga hirticula, the predominating species, was abundant in the Hollandale and Lamont districts but rare at Gays Mills. P. ilicis and P. rugosa were abundant at Gays Mills but less numerous elsewhere. As shown in Table 6, the five most common species, P. hirticula, P. fusca, P. rugosa, P. ilicis, and P. implicita, comprised 39.31, 23.48, 18.59, 7.21, and 3.68 percent, respectively, and together made up 92.27 percent of the total. The solitary specimen of P. spreta was taken from butternut at Gays Mills. Of the 7,280 beetles, 106 were taken at Gays Mills and 82 at Blue Mounds between the 1st and 26th of July, inclusive, and all the others before July 1. Because of their scarcity, the beetles taken after July 1 were not classified in a separate table as was the case with those taken in 1935.

Host preferences.---Table 7, which is similar to tables 2, 3, and 5, showing the number of each species of beetles taken from each kind of host plant (or related group of host plants) and the percentage of the total each species comprised, is a consolidation of collections made during 52 flights in 10 districts in southwestern Wisconsin. Thirty-two flights were observed on 30 nights at Gays Mills and 21 flights on 19 nights in the remaining 9 areas. The groves, where observations were made, were near the following towns: Gays Mills, Crawford County; Waunakee, Madison, Blue Mounds,^{8/} Dane County; Edgerton,^{9/} Rock County; Hollandale, Iowa County; Lodi, Poynette, and Leeds, Columbia County.

⁸ The grove was south of Blue Mounds, near the border of Iowa County.

⁹ The grove was north of Edgerton, in Dane County.

Table 6.---Adults of Phyllophaga collected in 1937
by species and the percentage of the total represented
by each species

Species	Beetles Number	Percentage of total
<u>P. hirticula</u> -----	2,862	39.31
<u>P. fusca</u> -----	1,709	23.48
<u>P. rugosa</u> -----	1,353	18.59
<u>P. ilicis</u> -----	525	7.21
<u>P. implicita</u> -----	268	3.68
<u>P. drakei</u> -----	227	3.12
<u>P. tristis</u> -----	121	1.66
<u>P. nitida</u> -----	92	1.26
<u>P. crenulata</u> -----	59	.81
<u>P. futilis</u> -----	30	.41
<u>P. marginalis</u> -----	16	.22
<u>P. anxia</u> -----	12	.16
<u>P. prunina</u> -----	4	.05
<u>P. balia</u> -----	1	.01
<u>P. spreata</u> -----	1	.01
<u>Total</u> -----	7,280	99.98

Table 7.-Beetles of Phyllophaga collected from host plants, 1937

Host Plants	<i>P. hirticollis</i>	<i>P. fusca</i>	<i>P. rugosa</i>	<i>P. ilicis</i>	<i>P. impilicita</i>	<i>P. drakei</i>	<i>P. tristis</i>	<i>P. nitida</i>	<i>P. crenulata</i>	<i>P. futilis</i>	<i>P. marginalis</i>	<i>P. annia</i>	<i>P. prunina</i>	<i>P. balla</i>	<i>P. septa</i>	Totals	% of total beetles on host
Hazel	49.30% 1411 64.90%	12.35% 80 9.71%	5.91% 211 3.68%	43.43% 228 10.49%		69.16% 157 7.22%		22.83% 21 .97%	88.14% 52 2.39%	13.33% 4 .18%	37.50% 6 .28%	16.67% 2 .09%	50.00% 2 .09%			2174 100%	29.86%
Hickory	20.27% 580 57.43%	12.35% 211 20.89%	11.01% 149 14.75%	12.95% 68 6.73%						3.33% 1 .10%	6.25% 1 .10%					1010 100%	13.87%
Cherry (Cultivated)		2.05% 35 18.61%	45.90% 621 91.73%	2.86% 15 2.14%	1.49% 4 1.26%						16.67% 2 .30%					677 100.01%	9.30%
Butternut	.24% 7 1.15%	18.61% 318 52.30%	10.13% 137 22.53%	26.10% 137 22.53%	1.12% 3 .49%			3.26% 3 .49%			6.25% 1 .16%			100% 1 .16%	100% 1 .16%	608 99.97%	8.35%
For Oak	8.11% 232 42.88%	13.52% 231 42.70%	1.26% 17 3.14%			.44% 1 .18%	46.28% 56 10.35%	3.26% 3 .55%			6.25% 1 .18%					541 99.98%	7.43%
Red Oak Group	8.32% 238 48.77%	8.78% 150 30.74%	2.14% 29 5.94%	.38% 2 .41%	1.12% 3 .61%	1.32% 3 .61%	47.11% 57 11.68%	1.09% 3 .20%	1.69% 1 .20%	3.33% 1 .20%	12.50% 2 .41%	8.33% 1 .20%				488 99.97%	6.70%
Aspen	.87% 25 7.58%	8.78% 150 45.45%	3.25% 44 13.33%	1.33% 7 2.12%	35.07% 94 28.48%	3.52% 8 2.42%					12.50% 2 .61%					330 99.99%	4.53%
Dogwood	.38% 11 4.51%	7.55% 129 52.87%	.59% 8 3.28%	.57% 3 1.23%		20.70% 47 19.26%	.83% 1 .41%	44.57% 41 16.80%		10.00% 3 1.23%	6.25% 1 .41%					244 100%	3.35%
Willow	.10% 3 1.52%	.59% 10 1.35%	2.00% 27 3.52%		51.49% 138 74.59%	.88% 2 1.08%				6.67% 2 1.08%	6.25% 1 1.08%	16.67% 2 2.08%				185 99.39%	2.54%
Walnut	4.58% 131 80.86%	1.35% 23 14.20%			.75% 2 1.23%		.83% 1 .62%			6.67% 2 1.08%	5.56% 3 1.85%	25.00% 3 1.85%				162 99.99%	2.23%
Plum	3.70% 106 75.18%	1.40% 24 17.02%	.30% 4 2.84%	.19% 1 .71%	.37% 1 .71%	.44% 1 .71%				13.33% 4 2.84%						141 100.01%	1.94%
Poplar (Except Aspen)	3.10% 53 38.68%	5.10% 69 50.36%	.19% 1 .73%	5.22% 14 10.22%												137 99.99%	1.88%
Ironwood	1.05% 18 20.69%	4.21% 57 65.52%	1.90% 10 11.49%	.37% 1 1.15%				1.09% 1 1.15%								87 100%	1.19%
White Oak	2.11% 36 44.44%	2.66% 36 44.44%	.95% 5 6.17%			2.48% 3 3.70%				3.33% 1 1.23%						81 99.98%	1.11%
Elm	.07% 2 2.74%	1.93% 19 45.21%	1.40% 8 26.03%	1.52% 6 10.96%	2.24% 6 8.22%	.44% 1 1.37%				6.67% 2 2.74%	8.33% 1 1.37%	25.00% 1 1.37%				73 100.01%	1.00%
(Redwood) Linden	.64% 11 18.64%	2.59% 35 59.32%	1.71% 9 15.25%	.75% 2 3.39%			.83% 1 1.69%					25.00% 1 1.69%				59 99.98%	.81%
Blackberry	1.57% 45 90.00%	.23% 4 8.00%								3.33% 1 2.00%						50 100%	.69%
Raspberry	.52% 15 38.46%	.23% 4 10.26%				.88% 2 5.13%		18.48% 17 43.59%			6.25% 1 2.56%					39 100%	.54%
Crataegus	.03% 1 2.78%	.99% 17 47.22%	.61% 11 30.56%	1.33% 7 19.44%												36 100%	.49%
Gonosberry	.80% 23 76.67%	.06% 1 3.33%				.44% 1 3.33%				13.33% 4 13.33%	8.33% 1 3.33%					30 99.99%	.41%
Cherry (Wild)	.45% 13 44.83%	.76% 13 44.83%						3.39% 2 6.90%	3.33% 1 3.45%							29 100.01%	.40%
Hickory (Pignut)	.18% 3 11.11%	.37% 5 18.22%	3.62% 19 70.37%													27 100%	.37%
Birch	.28% 8 34.78%	.70% 12 52.17%	.07% 1 4.35%	.38% 2 8.70%												23 100%	.32%
Rose	.24% 7 38.89%	.29% 5 27.78%	.07% 1 5.56%			1.76% 4 22.22%		1.09% 1 5.56%								18 99.99%	.25%
Ash	.45% 13 50.00%	.76% 13 12.5%		.57% 3 37.5%												8 100%	.11%
Elderberry						1.65% 2 50.00%		2.17% 2 50.00%								4 100%	.05%
Ash Prickly										13.33% 4 100.00%						4 100%	.05%
Grass	.03% 1 33.33%								3.39% 2 66.66%							3 99.99%	.04%
Apple	.07% 2 100.00%							2.17% 2 100.00%								2 100%	.03%
Currant (Wild)		.12% 2 100.00%														2 100%	.03%
Apple (Thorn)			.15% 2 100.00%													2 100%	.03%
Sunae																2 100%	.03%
Weed sp?	.03% 1 100.00%															1 100%	.01%
Lead Plant									1.69% 1 100.00%							1 100%	.01%
Poison Ivy									1.69% 1 100.00%							1 100%	.01%
Locust		.06% 1 100.00%														1 100%	.01%
Total	99.96% 2862 39.31%	100.01% 1709 23.48%	99.99% 1353 18.59%	99.98% 525 7.21%	99.99% 268 3.68%	99.98% 227 3.12%	100.01% 121 1.66%	100.01% 92 1.26%	99.99% 59 .81%	99.98% 30 .41%	100.00% 16 .22%	100.00% 12 .16%	100.00% 4 .05%	100.00% 1 .01%	100% 1 .01%	7280 99.98%	99.97%

Phyllophaga hirticula was taken from 21 kinds of plants. Hazel supplied 49.30 percent of the total number of beetles taken. Hickory, oaks of the red oak group, bur oak, and walnut yielded 20.27, 8.32, 8.11, and .58 percent, respectively, and together with hazel, 90.58 percent of the total.

Phyllophaga fusca was taken from 27 species of host plants. Butternut, bur oak, hazel, hickory, oaks of the red oak group, aspen, and dogwood supplied 8.61, 13.52, 12.35, 12.35, 8.78, 8.78, and 7.55 percent of the total, respectively, and together 81.94 percent. A diversified feeding habit was indicated in 1937, as in 1935 and 1936. This species did not feed heavily on cultivated cherry, as it did in 1935.

Phyllophaga rugosa was taken from 21 kinds of host plants. Cultivated cherry at Gays Mills supplied 45.90 percent of the total beetles of this species. Hickory, butternut, hazel, poplars other than aspen, ironwood, and aspen yielded 1.01, 10.13, 5.91, 5.10, 4.21, and 3.25 percent of the total, respectively. Together with cherry, these hosts yielded 85.51 percent of the total.

Most of the Phyllophaga ilicis adults were taken at Gays Mills. This species was taken from 17 kinds of host plants, hazel, butternut, hickory, and lignut hickory yielding 43.43, 26.10, 12.95, and 3.62 percent of the total, respectively, and together 86.10 percent.

Phyllophaga implicita was found throughout southwestern Wisconsin but was rather scarce at Gays Mills. It was collected from 11 kinds of host plants. Willow and aspen yielded 51.49 and 35.07 percent, respectively, and together 86.56 percent of the total.

Summary of collections, 1935 to 1937, inclusive

Since the population of various species of June beetles varies among the different broods, it is desirable to summarize the populations of the various species on the 3-year basis.

Table 8 shows the number of each species of beetle taken each year during the period 1935-37, inclusive, the total number of beetles of each species for the 3-year period, and the percentage of the grand total of beetles represented by each species. Phyllophaga rugosa and P. hirticula were taken in about equal numbers, these two species constituting 67.15 percent of the total. P. tristis was probably as abundant as either of these two species, but in 1936, when they were most abundant, they were more numerous in areas where tall oaks predominated; consequently no samples of value could be taken. In 1937 P. ilicis was among the six most abundant species, including P. tristis, but in other years it had not been important.

Table 8.--Beetles of Phyllophaga collected, 1935-37

Species	1935	1936	1937	Total	
	Number	Number	Number	Number	Percent
<i>P. rugosa</i> -----	5,103	405	1,353	6,861	33.71
<i>P. hirticula</i> -----	3,936	9	2,862	6,807	33.44
<i>P. fusca</i> -----	2,143	98	1,709	3,950	19.41
<i>P. implicita</i> -----	323	176	268	767	3.77
<i>P. ilicis</i> -----	50	68	525	643	3.16
<i>P. tristis</i> -----	317	¹ /90	121	528	2.59
<i>P. drakei</i> -----	26	26	227	279	1.37
<i>P. nitida</i> -----	23	44	92	159	.78
<i>P. futilis</i> -----	28	87	30	145	.71
<i>P. balia</i> -----	72	6	1	79	.39
<i>P. crenulata</i> -----	3	1	59	63	.31
<i>P. marginalis</i> -----	6	6	16	28	.14
<i>P. anxia</i> -----	13	2	12	27	.13
<i>P. spreata</i> -----	7	0	1	8	.04
<i>P. prunina</i> -----	3	0	4	7	.03
<i>P. inversa</i> -----	0	3	0	3	.01
Total -----	12,053	1,021	7,280	20,354	99.99

¹/_{P. tristis} from oaks not included.

The kinds of host plants from which most of the beetles were taken during the 3-year period are shown in table 9. The number of beetles taken from each host in each year, the total taken from each host during the 3-year period, and the percentage of the number of all beetles collected which each host furnished, are also given. Bur oak supplied 21.19 percent of the total and hazel 14.07 percent. The nine species given together supplied 85.55 percent of the total beetles. These records are interesting, as they show the importance of oaks, hickories, poplars, cultivated cherry (when this is in the midst of an infested area), hazel, and dogwood, as hosts.

Table 9.--Principal hosts from 1935 to 1937, inclusive, and the total number of Phyllophaga beetles taken from each

Species	1935	1936	1937	Total	
	Number	Number	Number	Number	Percent
Bur oak-----	3,727	44	541	4,312	21.19
Hazel-----	594	95	2,174	2,863	14.07
Hickory-----	1,461	38	1,010	2,509	12.33
Cultivated cherry	1,530	114	677	2,321	11.40
Populus sp.-----	969	154	467	1,590	7.80
Willow-----	977	128	185	1,290	6.34
Butternut-----	239	57	608	904	4.44
Red oak group----	311	55	488	854	4.20
Dogwood-----	439	87	244	770	3.78
Total, 9 hosts--	--	--	--	17,413	85.55
Total, all hosts:	--	--	--	20,354	--

Discussion

These studies are important in their relation to the control of beetles of the genus Phyllophaga by spraying their host plants. From three seasons' work it would appear that the control of the six predominant species in southern Wisconsin would effectually solve the June beetle problem in that region. These species are P. rugosa, P. hirticula, P. fusca, P. tristis, P. implicita, and P. ilicis. The first four of these are considerably more abundant than the last two. P. tristis could apparently be controlled by spraying oaks, especially bur oak, with an effective insecticide; P. hirticula by spraying oaks, especially bur oak, and in some cases hazel and hickory as well; P. implicita by spraying poplars and willows; and P. ilicis by spraying hazel, butternut, and hickory. P. rugosa and P. fusca were found on a large variety of host plants so the spraying of a single species, or even several species, might not materially reduce the numbers of beetles of these species. P. implicita and P. ilicis have rarely, if ever, been encountered as grubs in our sample diggings in cultivated fields and these species may not be important as pests of field crops. Grubs dug from pastures, grain stubble, and corn have chiefly belonged to the species P. rugosa, P. hirticula, P. fusca, and P. tristis, although P. futilis grubs are fairly common in Lafayette County, and the general destruction of adults of these species apparently would solve the grub problem.

There are still many obstacles in the way of spraying trees for control of June beetles. In addition to the fact that no entirely satisfactory insecticide for June beetles has been found, there are many tall trees in southern Wisconsin and spraying these requires the use of an efficient power sprayer equipped with long leads of hose; the host plants are often located in mixed plantings near the tops of hills and sometimes at considerable distances from water; and the groves where beetles tend to concentrate are often scattered. One condition favorable for their destruction, however, is the tendency for maximum defoliation to occur where bur oaks are predominant.

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THE MORE IMPORTANT RECORDS FOR JUNE

The development of grasshoppers has been uneven, and all stages are present, from the egg to the adult. Adults are mating in the southern part of the infested territory. Despite the effect of cool, rainy weather, which killed many young nymphs, the number surviving and individuals that hatched later ~~make up~~ great populations over the entire infested territory. The rains may prove beneficial by producing succulent wild vegetation, affording food for the hoppers and preventing them from severely injuring cultivated crops.

The Mormon cricket is occurring in great abundance and is extending its depredations farther eastward than before, injuring crops in Nebraska; however, inclement weather has delayed development of the pest and the actual damage to crops, especially in the Rocky Mountain region, has been less extensive than in 1937.

Owing to the prolonged cool, rainy weather, cutworm damage continued later in the season than usual.

The armyworm outbreak in the Mississippi and Ohio Valleys has largely subsided; however, moths are abundant farther north, around the Great Lakes. A disease evidently played an important part in the control.

Although weather conditions have been unfavorable to chinch bug development, isolated areas of infestation, from moderate to severe, are found throughout the chinch bug belt.

The hessian fly has multiplied greatly and, although damage to the wheat crop is moderate, the population in many localities may be sufficient to menace the crop to be planted this fall.

The corn ear worm is occurring in usual abundance in sweet corn and tomato over most of the South. Farther north, in Illinois and New York, infestation is occurring a little early.

The stalk borer was reported as more abundant than usual in a strip from New York westward to Nebraska.

The codling moth development early in the spring portended a heavy early infestation, but cool weather late in May and early in June in most localities in the East and Middle West checked activities, and the infestation in those areas is about normal.

The oriental fruit moth is more abundant than usual from New Jersey southward to Georgia and in Kentucky and Tennessee. It was also reported from a locality in Louisiana, where it had not been recorded previously.

The walnut caterpillar is occurring on pecan in Mississippi, Missouri, Oklahoma, and Texas, where it was so destructive last year.

The Mexican bean beetle is destructively abundant over the infested territory east of the Mississippi River. It was reported for the first time from Arkansas and Louisiana.

The pea aphid outbreak has largely subsided.

Boll weevils are reported generally from the Atlantic coast to Texas and Oklahoma, including large areas in those States. Most of the reports indicate that the weevils were more numerous in June 1938 than in June 1937 or 1936.

THE MORE IMPORTANT ENTOMOLOGICAL FEATURES IN CANADA FOR MAY-JUNE

At the end of May cool weather in Manitoba and abundant rainfall in southern Alberta had delayed the hatching of grasshoppers; however, by the end of the third week in June they were numerous locally in southwestern Manitoba, and abundant and active over a large part of the prairie region of Alberta. In Saskatchewan hatching was becoming general by the end of May. Latest reports (June 21) indicated that considerable damage was developing in northwestern and some north-central areas. There was also some damage in the southeast. The spreading of poisoned bait in organized control campaigns was well under way in many districts.

Severe infestations of the pale western cutworm were reported developing in various localities in Saskatchewan and serious crop losses had occurred from Battleford to Mervin and Paynton, Eastend to Dollard, and in Carlton, Cantuar, Ponteix, and Rush Lake districts. Cutworm damage

in southern Alberta was curtailed by abundant rainfall in May, but some losses occurred from Milk River to Wainwright. Losses were most severe in the extreme north and south.

Unusually heavy damage to the wheat crop by wireworms was reported in Saskatchewan, where infestations are much higher than a few years ago, especially in areas affected by prolonged drought. Damage also occurred in southern Alberta, where losses up to 15 percent were reported in a number of localities. Conservative estimates from a subsequent check-up indicated a total loss of from 5 to 10 percent of the wheat acreage, with the worst affected areas reseeded. These insects are more prevalent in southwestern Ontario than for several years and are damaging crops such as tobacco and tomato.

Major flights of June beetles are occurring over a large part of Ontario and in Quebec from Papineau County westward. The last major flight occurred over the same territory in 1935.

The species Sitona lineatus L., which was first discovered in North America in the vicinity of Victoria and on the Saanich Peninsula, British Columbia, in 1937, has spread over the entire peninsula. It attacks legumes, principally peas and beans, and many complaints have been received regarding it. The species Brachyrhinus singularis L., which was also reported for the first time last year, at Victoria, British Columbia, is a general feeder, and is giving much trouble in gardens.

Heavy infestations of the forest tent caterpillar developed in the Ottawa and St. Lawrence River Valleys. The eastern tent caterpillar was also numerous in many localities.

Much foliage injury to boxelders by the fall canker worm was reported in parts of southern Manitoba and in Saskatchewan.

Outbreaks of tick paralysis among sheep and cattle, caused by the paralysis tick, Dermacentor andersoni Stiles, occurred in several localities in the interior of British Columbia. Cases in humans were reported at Lytton and Rossland, British Columbia. The last case affected a young girl and terminated fatally. A preliminary report on a dead rabbit infested with the rabbit tick, Haemaphysalis leporis palustris Pack., picked up near Vavenby, British Columbia, indicated tularemia.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Indiana. C. Benton (June 20): Numerous small grasshoppers were observed in spots along roadsides near La Fayette on June 13-17.
- Illinois. W. P. Flint (June 23): The heavy rains late in May and the first half of June have greatly reduced grasshopper injury. Hoppers have been hatching quite generally in the southern half of the State and hatch is nearly complete for the southern two-thirds. Melanoplus bivittatus (Say) is more abundant than at any time for the past several seasons. Adults of this species are maturing and mating.
- Minnesota. A. G. Ruggles (June): Spotted hatching and damage occurring. Only 10 percent of the eggs hatched in some places, in others 50-70 percent.
- Iowa. C. J. Drake (June 25): Baiting is being carried on in the two southern tiers of counties and in the western part of Iowa. Heavy rains have destroyed large numbers of newly hatched hoppers but in some of the most heavily infested areas it is not uncommon to find newly hatched hoppers running from 200 to 300 per square yard in seeded alfalfa and clover fields. Hatching is not yet complete.
- Missouri. L. Haseman (June 24): The abundance of nymphs in carefully checked areas throughout the State, where excessive rainfall occurred, has shown very definite reduction. Rain has also retarded hatching and has provided abundance of wild vegetation which may carry the pest throughout the rest of the summer. The two-lined grasshopper (M. bivittatus), the confused grasshopper (M. confusus Scudd.), and the lesser migratory grasshopper (M. Mexicanus Sauss.) are now appearing as adults in considerable numbers and are mating. The last of these are showing practically mature eggs.
- North Dakota. J. A. Munro (June 21): Adults are appearing in the southern part of the State, M. mexicanus being the predominating species. Hatching in the north is not yet complete.
- South Dakota. H. C. Severin (June): Idle lands are furnishing untold millions of hoppers, of which M. mexicanus and M. bivittatus are the most important species.
- Nebraska. M. H. Swenk (June 22): The eggs of Melanoplus spp. have now, after 6 weeks of slow but continuous hatching, largely hatched. Hatching proceeded more rapidly in western than in eastern Nebraska, the opposite of the usual condition, owing to the prolonged cool, rainy weather that has

prevailed over eastern and southeastern Nebraska. M. mexicanus has largely completed its development. M. bivittatus and M. differentialis (Thos.) are now mostly half-grown nymphs, just beginning to move freely from the hatching grounds and concentrate on the edges of the cultivated fields. Heavy populations are present in all parts of the State. Grasshoppers are being parasitized by Sarcophaga kellyi Ald. and other parasitic flies during the last week or ten days.

ansas. J. R. Horton (June 21): Hoppers were extremely numerous in the early stages in the vicinity of Wichita, and have severely damaged tender, young growth of various crops. Their numbers have decreased steadily and very considerably since April 1 but they are still numerous and beginning to do serious damage in isolated locations. Many are now in the winged stage. They have not attacked young field corn in one spot where they are numerous. They do not respond well to control measures in the presence of tender young plant food.

H. R. Bryson (June 25): Rather doubtful whether grasshoppers are more abundant than last year. They have not migrated into the rowed crops but are still in the weeds, turn rows, and roadsides. Heavy infestations are spotted.

klahoma. C. F. Stiles (June 22): So far the damage has been light, due to excessive rains over the entire State. Rainfall is much above normal and vegetation is ranker than it has been for a number of years. The hopper population, however, has not been very much affected by the weather. We have them by the billions scattered over the entire State, with the exception of a few mountainous counties in the southeast. The principal species are M. bivittatus, M. packardii Scudd., M. mexicanus, and M. differentialis. Dissosteira longipennis Thos. is present in small numbers in all of our western counties, and poisoning is under way for migrating bands into these counties.

exas. F. L. Thomas (June 24): Grasshoppers constitute a threat to all crops in parts of at least 117 counties. The most serious outbreaks have occurred in northwestern Texas. Very good control is being obtained.

tah. G. F. Knowlton (June): Grasshoppers were reported as very abundant and attacking alfalfa, sugar beets, and other crops in the north-central and central parts of the State, from June 10 through June 23, and on June 24, serious injury was reported from the Uintah Basin.

regon. D. C. Mote (June): Hatching throughout the month in eastern Oregon. First instar to adult stages are present.

isconsin. E. L. Chambers (June 28): M. femur-rubrum, the species responsible for the greatest injury last year, is just beginning to hatch all over the State. M. mexicanus began to hatch before the middle of April, and was checked very little by the weather. Control was started on the sandy soil of northwestern Wisconsin before May 20.

MORMON CRICKET (Anabrus simplex Hald.)

North Dakota. J. A. Munro (June 21): Heavy infestations have been observed in Adams County, in the southwestern area, and Burleigh and Emmons Counties in the south-central part of the State. The infestations are more or less localized but rapidly spreading over large areas. No serious crop loss reported.

South Dakota. H. C. Severin (June): Mormon crickets have increased in abundance greatly, but have done little damage to field and garden crops.

Nebraska and Wyoming. M. H. Swenk (June 22): On June 14 a severe outbreak was reported in western Scotts Bluff County, Nebr. This is the first instance of severe damage within the boundaries of Nebraska of which we have record, although the species has long been known to occur in small numbers in the western and central parts of the State. Severe infestations are in progress in Wyoming, a short distance west of the State line.

Utah. C. J. Sorenson (June 20): Increased numbers of bands are migrating from range lands, foothills, and mountains in central Utah to menace crops on isolated ranches. Crop damage being prevented. Infestation in Millard County largely eradicated except in mountainous areas. Two small bands have migrated from Juab County into the southern end of Cedar Valley, Utah County; all on range land, several miles distant from crop lands.

CUTWORMS (Noctuidae)

Mississippi. C. Lyle (June 24): Specimens of Feltia annexa Treit. and F. gladiaria Morr. were sent in from Philadelphia, Neshoba County, in the east-central part of the State, with a report that they had caused moderate damage to cotton following cover crops. Specimens of Prodenia ornithogalli Guen. were sent in from Liberty, Amite County, in the southwestern part of the State on June 20, with a report that they were causing moderate damage to cotton squares.

Michigan. R. Hutson (June 22): Adults of Lampra alternata Grote and Agrotis unicolor Walk. are emerging in numbers at Watervliet, South Haven, Grand Rapids, Fennville, and Shelby, in southwestern Michigan.

Minnesota. A. G. Ruggles and assistants (June): On June 9 at Knutson, Ramsey County, in the southeastern part of the State, A. c-nigrum (L.) moths were coming to baits in great numbers, along with other species.

Nebraska. M. H. Swenk (June 22): Flights of moths of the western army cutworm, Chorizagrotis auxiliaris Grote, which began to be heavy about the middle of May in all parts of the State, have continued to cause many complaints from May 21 to June 20. The variegated cutworm (Lyceophotia margaritosa saucia Hbn.), which species began flying on April 19 in the vicinity of Lincoln, in the southeastern part of the State, reached its height of activity shortly after the middle of May, and then dwindled to a mere sprinkling about June 5.

D. B. Whelan (June 22): Cutworms have been somewhat more than normally abundant and injurious from May 21 through June 20 in gardens and corn-fields especially. The period of their greatest destructiveness was from May 23 to June 7. Moths of the black cutworm, or greasy cutworm, A. ypsilon Rott., have been flying since April 23, most abundantly during the last week in April and the first week in May, around mid-May, and again during the second week in June. Moths of the spotted cutworm, A. c-nigrum, were flying abundantly from May 17 to June 13, reaching a maximum on June 3. Moths of the cotton cutworm, Prodenia ornithogalli, were flying from May 4 on, and in greatest numbers from June 7 to 15. The bristly cutworm, Polia renigera Steph., was present in fairly heavy flights from May 25 on, especially from May 31 to June 10. Moths of the dark-sided cutworm, Euxoa messoria Harr., were not noted until June 10, and are still flying in moderate abundance. The dusky cutworm, F. venerabilis Walk., was reported destroying completely a growth of burningbush (Kochia scoparia) in Boone County on May 27.

Wyoming. M. D. Carson (June): Approximately 100 acres of sugar beets, corn, and alfalfa had been injured in Platte County, in southeastern Wyoming, by May 27, by Chorizagrotis auxiliaris. A few complaints have come in since then. (Det. by Margaret Greenwald.)

Utah. G. F. Knowlton (June 8): Adults of A. c-nigrum, are coming to trap lights at Logan in Cache County.
(June 14): Numerous adults of the striped beet caterpillar, Scotogramma trifolii Rott., have been coming to the trap light at Spanish Fork, Utah County.
(June 20): Relatively few Porosagrotis orthogonia Morr. as compared with the number in 1937. They are now entering the prepupal stage.

BEET WEBWORM (Loxostege sticticalis L.)

South Dakota. H. C. Severin (June): Sugar beet webworms have made their appearance in many areas and have done some damage.

Nebraska. M. H. Swenk (June 22): A serious outbreak of this pest, evidently originating from infestations on chenopodiaceous weeds, was reported on June 20 from Box Butte County, in western Nebraska, where control measures were resorted to.

Wyoming. Margaret Greenwald (June 15): Adults have been flying since early in May in Park County, in northwestern Wyoming, but have been noticed to be unusually numerous the last two weeks.

Utah. H. E. Dorst (June 23): Very few of these moths have been observed in beet fields in northern Utah. No injury is anticipated as beets are too large.

FALL ARMYWORM (Laphygma frugiperda S. & A.)

Mississippi. C. Lyle (June 24): Larvae, almost full-grown, were received from Avera, in Greene County, in southeastern Mississippi, with a report that they were abundant in buds of corn.

WIREWORMS (Elateridae)

Kentucky. M. L. Didlake (June 1): Wireworms are causing injury to newly set tobacco plants more severely than usual at Lexington.

North Dakota. J. A. Munro (June 21): Serious injury to wheat and corn reported from Bottineau, Rollette, Divide, Emmons, and Eddy Counties and the north western part of Cass County. The prairie grain wireworm, Ludius aeneipennis Kby., is the predominating species.

Nebraska. M. H. Swenk (June 22): Wireworms (Melanotus sp.) were reported from Cuming County on June 8, as completely destroying seed corn on bottom lands.

Wyoming. Margaret Greenwald (June 10): Wireworm damage in Park County restricted to relatively small areas in some bean fields where seed is usually completely destroyed.

WHITE GRUBS (Phyllophaga spp.)

South Carolina. O. L. Cartwright (June 10): P. prununculina Burm. was found in considerable numbers feeding on pine at Blackville on June 8. The following beetles were taken in numbers in the Blackville trap-light: P. gracilis Burm., May 8 to June 21, and P. uniformis Blanch., on June 10 to June 21.

Louisiana. B. A. Osterberger (June 15): Since about June 15, many undetermined June bugs have been in flight at Baton Rouge from dusk to almost midnight.

Indiana. P. Luginbill and H. R. Painter (June 20): Severe damage is being done to bluegrass in a 60-acre pasture tract near La Fayette.

Michigan. R. Hutson (June 22): P. crenulata Froel. and P. rugosa Melsh. were reported from Frankfort, northern lower peninsula, on June 15, as feeding on oak, gooseberry, rose, elm, dogwood, and grapes, as well as shrubs.

Minnesota. A. G. Ruggles (June): J. Medler reported on June 9 that a heavy flight of adults was seen at light traps in Ramsey County.

Iowa. H. E. Jaques (June 23): May beetles are rather late in appearing but are very abundant generally.

Nebraska. M. H. Swenk (June 22): From Dixon and Butler Counties, in eastern Nebraska, on June 17, there came reports of white grubs destroying the roots of strawberry plants that had been set out this year.

Kansas. H. R. Bryson (June 6): White grubs were reported to be injurious to strawberries at Wellsville and to pasture and meadow grass near Junction City. (June 22): Adults of P. lanceolata Say have been unusually abundant on the high prairie land the entire month of June in the vicinity of Manhattan. Many of the beetles are parasitized.

Oklahoma. F. A. Fenton (June 23): P. lanceolata reported present at Newkirk, Jet, and Blackwell, in the north-central part of the State. R. G. Dahms (June 23): Adults of P. lanceolata have been reported doing serious damage to young cotton plants in a few cases in southwestern Oklahoma.

Texas. O. G. Babcock and E. R. Lawrence (June 17): White grubs were reported as causing serious injury to pastures in some locations in Crockett County, north-central Texas. The grass was killed in spots ranging from 10 to 75 feet across. At a depth of 7 to 8 inches grubs were found at the rate of 4 to 8 per square foot. Mature beetles were identified as P. glabricula Lec. by H. J. Reinhard. White grubs were also reported as seriously injuring pasture land in Bosque County.

Utah. G. F. Knowlton (June 20): White grubs destroyed the marketability of 70 acres of potatoes in 1937 near Panguitch, south-central Utah. Grubs of various sizes are abundant in soil now planted to potatoes, alfalfa, and garden truck, in this area. The beetles were abundant during the past ten days.

JAPANESE BEETLE (Popillia japonica Newm.)

Connecticut. J. P. Johnson (June 20): The earliest emergence record for this State for the adult occurred this year at Bridgeport, on June 20. Results of soil surveys for grub development indicate an early emergence in considerable numbers.

New York. T. N. Dobbins (June 21): Larval development was retarded by the unusually cloudy and cool weather which characterized May and the greater part of June. In the New York City metropolitan area beetles were picked up on June 21, with indications that general emergence will be several days later than normal.

New Jersey. T. N. Dobbins (June 21): Beetles were picked up in the field, in southern New Jersey, on June 14.

T. L. Guyton (June 19): Noted first adults at Bound Brook, in northern New Jersey today.

Delaware. L. A. Stearns (June 25): First adult observed at Newark on June 2; adults beginning to appear in considerable numbers throughout New Castle County by June 21; noted in abundance on heads of mature wheat near Smyrna, in Kent County, on June 22.

Maryland. E. N. Cory (June 22): First adult on lower Eastern Shore on June 5 and at Princess Anne on June 7. Since then reports have come in from Baltimore and Prince Georges Counties.

ROSE CHAFER (Macrodactylus subspinosus F.)

Massachusetts. A. L. Bourne (June 24): The rose chafer made its appearance about June 8, but has not been so abundant as usual.

Connecticut. W. E. Britton (June 22): Very prevalent in some localities, less so than last year in others. In Milford the beetles were causing damage in peach and apple orchards. Reports of heavy feeding on elm foliage in Branford, North Haven, and Wallingford have been received.

New York. N. Y. State Coll. Agr. News Letter (June): Rose chafers are appearing in orchards and on truck crops.

Maryland. E. N. Cory (June 3): Reported as appearing generally on roses in the State.

Michigan. R. Hutson (June 22): Infestations have been brought to our attention from Shelby, Grand Rapids, Detroit, and Charlotte, all in southern Michigan.

A WEEVIL (Calomycterus setarius Roelofs)

Connecticut. M. P. Zappe (June 23): Leguminous plants at Stratford, in the southwestern part of the State, are being attacked. Adults are beginning to emerge.

Maryland. E. N. Cory (June 18). First seen on June 15 at Towson, in Baltimore County.

A PLANT BUG (Thyanta custator F.)

California. C. K. Fisher (June 14): These bugs are very numerous about one home garden and lawn in the city of Fresno, and on loganberries and blackberries. They have been observed on weeping willow, mulberry, flowers, shrubs, pine, and grass. They have increased in numbers very rapidly during the last two weeks.

COMMON RED SPIDER (Tetranychus telarius L.)

Ohio. N. F. Howard (June 18): Seriously injuring boxwood at Columbus.

Nebraska. M. H. Swenk (June 22): Severely injuring evergreens.

CEREAL AND FORAGE - CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

ARMYWORM (Cirphis unipuncta Haw.)

- New York. N. Y. State Coll. Agr. News Letter (June): Moths have been observed at lights on Long Island and occasional larval injury to young corn plants was noted. Traces of injury to corn in the lower Hudson River Valley were seen. In western New York great numbers of moths are being caught in light traps.
- Ohio. J. S. Houser (June 2-6): Adults were attracted in great abundance to the honeydew excreted by aphids on white-birch foliage at Wooster, Wayne County.
- T. H. Parks (June 22): While moths were caught in bait pans late in May and early in June, the only outbreak was in a field of barley in Butler County, southwestern Ohio, reported June 3.
- Indiana. J. J. Davis (June 13): Armyworm has been conspicuously abundant throughout the State in isolated areas, more especially in central and southern Indiana. Because of the lateness of corn planting, most of the injury has been to timothy and especially new pasture plantings and to small grain.
- L. F. Steiner (June 2): At Bicknell armyworm moths have appeared in traps in such numbers during the last few days that accurate records on codling moth are impossible. At Vincennes larvae have been attacked by disease, and mortality has reached nearly 100 percent.
- Illinois. W. P. Flint (June 23): The outbreak of May and early June is over. Bacterial disease was the most important factor in reducing injury. In many instances larvae were killed almost overnight by this disease.
- Michigan. R. Hutson (June 22): Moths were very numerous in light traps in East Lansing, southern Michigan, on the night of June 21.
- Kentucky. M. L. Didlake (June 20): Spring armyworm adults were seen at light at Lexington last night.
- North Dakota. J. A. Munro (June 23): Numerous adults are being taken at lights at Fargo and Jamestown, both in the southeastern part of the State.

Nebraska. M. H. Swenk (June 22): Moths began flying on April 23 in eastern and southeastern Nebraska and continued until May 10, reaching peaks on April 26 and May 2 to 4. Another period of heavy flights occurred from May 17 to 20, and a third from May 29 to June 19, reaching the status of enormous flights during the period from June 2 to 15. Many partly grown larvae were found well distributed through the wheatfields of southeastern Nebraska during the second week in June, and the following week they were fairly common on wheat heads, especially in the lower parts of the fields in Saunders, Sarpy, and Cass Counties, but not in migration or as yet in epidemic abundance. The first complaint of serious injury to wheat heads was received from Platte County on June 18.

Kansas. H. R. Bryson (May 31): Armyworms were reported eating the wheat heads near Lone Star, Douglas County, northeastern Kansas.

Utah. G. F. Knowlton (June 8): Adults have been coming to trap lights at Cedar City, Iron County, and Spanish Fork, Utah County.

CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton (June 20): The frequent hard rains have greatly reduced the new-brood nymphs. Although nymphs have been found since the first of June in small numbers, the bulk of those observed in the field near La Fayette, on June 13-17 were still mostly in the first to third instar, with occasionally fourth-instar nymphs. Since June 12 in some areas near La Fayette, there has been no rain, and parts of some fields of winter wheat and rye show from slight to moderately heavy infestation (up to 100 young bugs per foot of drill row).

G. E. Gould (June 25): On June 23 reports were received of a severe outbreak in southwestern Indiana, principally in the Knox County area. Infestations in all neighboring counties were reported.

Illinois. W. P. Flint (June 23): The heavy rains of May and early June have greatly reduced the threat of chinch bug damage. Barley fields are still carrying a fairly heavy infestation.

Iowa. C. J. Drake (June 25): Heavy local infestations occur throughout the two southern tiers of counties. Migration from small grain into corn has been reported from Clarke and Fremont Counties. A 40-acre field of corn in Union County was destroyed.

Missouri. L. Haseman (June 24): Despite the abundant rainfall chinch bugs are doing considerable damage on scattered farms throughout the State, but indications are that a general epidemic will not occur.

Oklahoma. C. F. Stiles (June 22): These bugs are quite numerous in scattered localities.

R. G. Dahms (June 23): Frequent heavy rains during May and the first half of June destroyed many first-generation nymphs and reduced the possibility of a serious outbreak in southwestern Oklahoma. Many bugs survived and are now doing some damage to susceptible sorghum varieties. Most of the first-generation bugs have reached the adult stage and are laying eggs.

PLANT BUGS (Miridae)

Ohio. T. H. Parks (June 10): Nymphs of an unidentified mirid have been received from three widely separated counties with specimens of injured wheat leaves.

Michigan. R. Hutson (June 22): The meadow plant bug (Miris dolabratus L.) has been reported as feeding on wheat in Adrian, Fremont, and Port Huron in scattered localities in the southern part of the State.

HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (June 28): Reports from surveys in 13 counties are in. The infestation in these counties varies from 4.3 percent for Madison County to 11.8 percent for Pickaway County, averaging 8.0 percent. This is a slight increase over that of a year ago. No very serious losses occurred and a very small percentage of the wheat is straw broken.

Indiana. J. J. Davis (June): The hessian fly seems to be definitely on the increase and has caused much wheat to lodge and a rather large loss in yield, especially in central Indiana. In many instances wheat is being cut green for ensilage because grain is not maturing.

C. Benton (June 20): On May 28 the first brood had practically completed pupation at Delphi, Carroll County, northwest of the center of the State. The first pupa of the first supplementary brood was found, the adults emerging early in June. The heaviest egg deposition occurred near June 4, although a few eggs were found through June 16. The majority of the larvae of the supplementary brood were in the half- and full-grown stages on June 16, a few small larvae and puparia being present. About 45 percent of the fly forms present in the wheat on June 20 represented the supplementary brood, which has caused very little commercial damage. The infestation in culms will add materially to the populations in many fields, and will be a potential menace to early sown wheat this fall. Reports of damage are received from various parts of the State, especially the west-central and northwestern parts. The amounts of damage reported and observed for individual fields vary from slight to occasionally severe.

Michigan. R. Hutson (June 22): Infestations ranging up to 10 percent are common in the southeast.

Missouri. L. Haseman (June 24): This pest is not causing any serious lodging of wheat.

Nebraska. M. H. Swenk (June 22): The hessian fly which, as a direct, cumulative effect of successive drought years, reached an excessively low population level in 1937, is again on the increase. Wheatfields examined in southeastern Nebraska, especially in Richardson and Pawnee Counties, in some instances showed moderate infestations late in May and early in June. Though no commercial damage occurred, infestations are sufficient to indicate that the fly may have to be taken in consideration when wheat is seeded in the fall of 1938.

Kansas. J. R. Horton (June 21): The spring period locally was characterized by moderate temperatures and frequent rains, a condition favorable to fly increase. This situation has not been sufficiently prolonged to raise the low general level of fly population surviving from 1937 to the level of outbreaks. It is difficult, if not impossible, to find a single outbreak. To show the possibilities in such a season, however, the second generation has increased in one especially favored, natural spot on spring wheat to 67 times the population of the originating first generation on winter wheat.

Kansas. R. H. Painter (June 25): The hessian fly has had a second generation wherever there are late tillers or late wheat plants. Eggs were laid under ideal conditions which resulted in almost 100-percent hatch.

SORGHUM WEBWORM (Celana sorghiella Riley)

Virginia. W. J. Schoene (June 21): Specimens received from Rockymount, Franklin County, and Chatham, in Pittsylvania County, in heads of rye. Injury has been reported from several sources. (Det. by C. Heinrich.)

WHEAT STEM MAGGOT (Meromyza americana Fitch)

Nebraska. M. H. Swenk (June 22): This maggot caused numerous whitened wheat heads in southeastern Nebraska, from Richardson County westward to Franklin County, early in June.

Kansas. R. H. Painter (June 25): The wheat stem maggot has returned to its normal abundance after being at a very low ebb last year.

WHEAT JOINTWORM (Harmolita tritici Fitch)

Missouri. L. Haseman (June 24): This pest has been extremely abundant. Unusual numbers of complaints have come from the southwestern part of the State, and at Columbia it is more abundant than usual.

CORN

CORN EAR WORM (Heliothis obsoleta F.)

New York. L. A. Carruth (June 24): On June 23 the first eggs to be found on Long Island on corn were observed in two fields between Hempstead and Valley Stream. The silks were just beginning to appear and those examined were 18 and 6 percent infested with newly laid eggs. In view of the unfavorable weather of the last month this is considered to be an early infestation, although in 1937 the first infestations were found slightly earlier. Pupae from field diggings in May are alive but have not yet emerged.

Illinois. R. A. Blanchard, A. F. Satterthwait and J. M. Wagner (June 24): Early market corn growing near East St. Louis had up to 35 percent of the ears infested on June 22, with severe damage in at least one early planting. An occasional egg was found in the vicinity of Urbana, in central Illinois, by June 16. This seems to be rather early for the insect to appear this far north. Last season the earliest record was June 27.

Kentucky. M. L. Didlake (June 23): This insect was abundant on early sweet corn at Lexington on June 23.

Missouri. R. A. Blanchard, A. F. Satterthwait, J. M. Wagner (June 24): Early planted corn in southern Missouri showed as high as 20 percent bud damage on June 8. Eggs were observed in considerable numbers near East Prairie on May 24.

Nebraska. D. B. Whelan (June 22): Half-grown larvae were found on columbine on June 2 at Lincoln.

Kansas. J. R. Horton (June 21): Moths began to emerge in the field cages at Wichita on June 3, and have continued intermittently up to June 17. This marks the first successful emergence of overwintered material in the cages. First eggs of the season were found on corn near the cages on June 16, one or more to every plant.

Oklahoma and Texas. E. V. Walter (June 20): From 100 to 500 stalks of corn were examined at intervals of about 10 miles between Dallas, Tex., and Muskogee, Okla., on June 1, and at intervals of about 5 miles between Muskogee and Joplin, Mo., on June 2. Infestations were about 50 percent at Kiowa and 2 percent at Muskogee, Okla. The farthest north that infestation could be determined was in a field near Pryor, Okla., where 3 stalks out of 300 examined showed feeding by first- or second-instar larvae. Larvae found in tops of every stalk examined near Dallas.

Utah. H. E. Dorst (June 23): A few eggs have been observed on very early sweet corn in northern Utah.

California. J. Wilcox (June 2): Upon being harvested 90 percent of the ears in a field of sweet corn at Olive, in southern California, were found to contain worms, at least 75 percent of the ears were thrown out or not picked because of damage. A field, just in tassel, had 40 percent of the tassels infested.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Vermont. H. L. Bailey (June 22): The first pupa was found in stubble in a field on June 7 at Manchester, Bennington County, in southwestern Vermont. First moth emerged from material freshly collected in that section on June 20. Larvae moderately abundant in stubble and waste stalks in Franklin County, in northwestern Vermont, on June 17, but no pupae found.

Connecticut. N. Turner (June 22): Although moths started emerging earlier than usual, the eggs were deposited later. Hatching is general and feeding is common. Indications are that the infestation in the Housatonic Valley is very heavy, but in other districts the same as or less than last year.

New York. L. A. Carruth (June 24): On western Long Island observations at intervals of 2-3 days during May and June indicate that the peak of pupation in field stubble occurred about May 15, the peak of pupation in barnyard stalks occurring about June 5 (2-generation strain). By June 15 practically all moths had emerged from stubble although emergence still continues in barnyards. Due to a backward season no eggs were found until June 4. Since that time numerous egg masses have been found, although infestations are variable in intensity. Up to June 23, the larvae found were mostly very young; on that day larvae two-thirds grown were found near Valley Stream. In the Hudson Valley observations made June 10 in Rockland, Dutchess, and Columbia Counties, and on June 13 in Albany County, disclosed egg masses in practically every field examined. The infestations were light and the eggs in most cases appeared to be newly laid. These observations confirm the presence of the 2-generation strain in the Hudson Valley. Observations in Rockland County on June 21 indicated that hatching had occurred although only small larvae were found.

New Jersey. C. A. Clark (June 20): A small number of egg masses were seen during the first week in June on early sweet corn in Burlington and Monmouth Counties. By June 13 eggs were numerous and hatching had started. (June 25): The first pupa of the first summer generation was found today. About 50 percent of the larvae are full-grown.

Ohio, Indiana, Michigan. A. M. Vance (June 3): Pupation and emergence in these States is more advanced in the spring of 1938 than in any previous year on record. The first pupa in 1938 was found west of Toledo, Ohio, on May 4, and the first evidence of moth emergence was noted in the same vicinity on May 26. The earliest previous records of pupation and emergence in this region were on May 26 and June 12, respectively, both obtained in 1936. On May 11, 1938, pupation of 1 percent had occurred in a cornfield examined in Allen County, Ind., and on June 1, 2 percent of the larvae had pupated at Mount Clemens, in southeastern Michigan. Near Toledo, in fields probably infested to a large extent by a second generation of the corn borer in 1937, pupation in 1938 averaged 6 percent on May 12, 64 percent on May 26, and 84 percent on May 31, and in all cornfields examined, the seasonal development of the insect was unusually advanced. The observed mortality in the region in the spring of 1938 averaged only 2 percent.

STALK BORER (Papaipema nebris nitela Guen.)

New York. R. W. Leiby (June 13): This borer is noticeably abundant in several counties, and is boring in stalks of recently set tomato plants.

Ohio. T. H. Parks (June 22): More than the usual number of complaints of this pest on corn (many accompanied by specimens), have been received during the last two weeks.

Indiana. G. E. Gould (June 23): During the last week damage to corn has been reported from all sections of Indiana. Damage was also reported on sweet corn and tomatoes.

Illinois. W. P. Flint (June 23): Specimens are being received from all sections of the State. The insect is partly in the early larval stages. Most of the specimens sent in are less than one-third grown.

Kentucky. M. L. Didlake (June): The common stalk borer is very abundant in the northeastern part of the State. It was injuring tobacco at Boyd, Harrison County, on June 6; corn at Georgetown, Scott County, on June 8; tomatoes, at Covington, Kenton County, on June 16; and corn at Louisa, Lawrence County, on June 20.

Michigan. R. Hutson (June 22): The common stalk borer was reported to be numerous in the vicinity of Monroe, Monroe County, and Shelby, Oceana County.

Iowa. C. J. Drake (June 25): The common stalk borer was found damaging corn in Pocahontas County, northwestern Iowa.

Nebraska. M. H. Swenk (June 22): Tomato plants in Gage and Thayer Counties were being damaged on June 12 and 18, respectively.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

Georgia. T. L. Bissell and S. B. Fenne (June 23): This pest has been damaging peanuts at Tifton, in southern Georgia. It was first observed on about June 10. The borers kill back shoots and severely stunt the plants.

Mississippi. C. Lyle (June 24): Specimens have recently been received from Greene, Jones, and Perry Counties, in southern Mississippi, with reports that they were causing considerable damage to corn.

CORN FLEA BEETLE (Chaetocnema pulicaria Melsh.)

Indiana. P. Luginbill (June 20): Beetles were reported early in June damaging corn at Hope, southeastern Indiana.

Oklahoma. E. V. Walter (June 20): From one to four flea beetles were found on every cornstalk examined in a field near Vinita, in the northeastern part of the State.

SUGARCANE BEETLE (Eutheola rugiceps Lec.)

Kentucky. M. L. Didlake (June): The rough-headed cornstalk beetle was abundant and doing serious injury to corn in several localities in western Kentucky, and at Somerset and Pulaski, in the southeastern part of the State, throughout the month.

Tennessee. G. M. Bentley (June 4): In several parts of the State this borer is causing injury by attacking cornstalks at the ground level.

Mississippi. C. Lyle (June 24): During the last few weeks specimens, accompanied by complaints of severe damage to corn or sugarcane, were received from scattered localities over the State.

A FLOWER BEETLE (Euphoria sepulcharis F.)

Florida. J. R. Watson (June 22): This insect was sent in from Jefferson County, western Florida, where it was reported to be doing considerable damage to corn.

Mississippi. C. Lyle (June 24): Feeding in buds of corn in southern Mississippi.

SLUGS (Mollusca)

Ohio. J. S. Houser (June 10): In June 1937 significant damage to field corn was observed in northeastern Ohio. It was reported today that several square rods of a field at Smithville, north-central Ohio, had been destroyed, and less severe damage occurred in many other places. The slugs retire to the soil during the day and ascend the stalks and riddle the leaves at night.

T. H. Parks (June 15): Calls from two county agents in northwestern Ohio revealed serious injury to corn from slugs which climbed the plants to feed on the leaves. In one field 6 acres had been injured.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

Colorado. J. H. Newton (June 20): Scouting work is nearly complete, and San Miguel County added to the list of known infested counties. Very light infestation appeared in Montezuma County.

Idaho. R. W. Haegle (June 18): The alfalfa weevil has been on the increase in Canyon County, in southwestern Idaho, for several years, and this year damage to the first crop amounted to nearly 50 percent on a number of farms. Other fields showed no injury, indicating spotted infestations.

Utah. G. F. Knowlton (June 16): Injury has been noted in many Utah counties during the last 2 weeks. Many farmers are cutting hay to stop the damage.

C. J. Sorenson. (June 20): Serious damage occurred in Millard and Wayne Counties.

Oregon. R. W. Bunn (June 7): Larvae found in Douglas County. (Det. by A. G. Boving.)

THREE-CORNERED ALFALFA HOPPER (Stictocephala festina Say)

Louisiana. C. O. Eddy (June): The alfalfa girdler is abundant in alfalfa fields and is already present in the soybean fields.

CLOVER

CLOVER ROOT BORER (Hylastinus obscurus Marsham)

Pennsylvania. R. M. Baker (June 23): Several fields of clover in Lancaster County, southeastern part of the State, are very heavily infested.

VETCH

VETCH BRUCHID (Bruchus brachialis Fahraeus)

New Jersey. C. A. Clark (June 20): Adults and fresh eggs were noted in abundance at Moorestown on June 13. A few hatched eggs were seen on June 18. Pods averaged 13 eggs each by June 18.

GRASS

A SAWFLY (Pachynematus extensicornis Nort.)

Pennsylvania. R. M. Baker (June 23): There was a severe outbreak in Erie County, northwestern Pennsylvania recently. The infestation extended over approximately 6 acres and the larvae were feeding by the millions, devouring all the grass in their path and advancing at a rate of approximately 100 yards per day.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

Louisiana. B. A. Osterberger, E. R. Lett, and A. L. Dugas (June): The extremely dry weather has delayed the development of the sugarcane borer to some extent. A few very heavily infested areas occur in spotted locations. The Trichogramma parasites are very active. Collections of eggs on cane and corn have shown that 68.7 percent of the eggs collected on corn are parasitized, and collections from sugarcane show 31.2 percent parasitized, which is very high for this time of the year.

SUGARCANE ROOTSTOCK WEEVIL (Anacentrinus subnudus Buchanan)

Louisiana. B. A. Osterberger (June): During the dry weather, the number of adults collected in routine examinations of cane stubbles and grasses has decreased. Early in the spring, damage was noticeable in plant cane, especially in St. Mary Parish.

FRUIT INSECTS

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Georgia. O. I. Snapp (June 20): The infestation on peach trees at Fort Valley, in central Georgia, is less than normal. It was reported on December 20, 1937, to be the lightest of the 18 seasons that the insect has been under observation in this locality, and it has not built up an infestation equal to that of an average year.

Kentucky. M. L. Didlake (June 9): San Jose scale was reported to be abundant in one orchard at Henderson, in northwestern Kentucky, on June 9.

Tennessee. G. M. Bentley (June 9): A heavy infestation was found on plum at Madison, Davidson County, in north-central Tennessee.

EUROPEAN FRUIT LECANIUM (Lecanium corni Bouche)

New York. N. Y. State Coll. Agr. News Letter (June): This scale is fairly abundant in prune orchards in Niagara County, in western New York.

Ohio. J. S. Houser (June 13): Grape near Wooster, in central Ohio, infested. It is unusual for a coccid of this type to appear in abundance on grape under Ohio conditions. (Det. by H. Morrison.)

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (June 24): Weather conditions in the Hudson River Valley during May retarded the unusually early development of the codling moth so much that at present development appears to be normal. Peak activity, as determined by bait traps, occurred from May 31 to June 2, which is the same time at which similar activity occurred during 1936 and 1937. Larval entrances were found in the fruit as early as June 4. Entrances are hard to find in well-sprayed orchards, most of which are less than a week old. Weather conditions have been favorable for development during the last 2 weeks.

S. W. Harman (June 25): Emergence in western New York was hastened by hot weather, resulting in first-brood worms being injurious in heavily infested orchards.

- New Jersey. H. W. Allen (June): In several orchards in Burlington and Camden Counties, in southern New Jersey, injury by the first brood seems to be appreciably less than last year.
- Pennsylvania. H. E. Hodgkiss (June 16): Bait pails show large catches near buildings. Adults are emerging in large numbers from picking baskets and crates in storage sheds.
- Delaware. L. A. Stearns (June 25): Infestation by the first brood is subnormal, owing to early emergence of spring-brood moths and unfavorable weather during the egg-laying period.
- Virginia. A. M. Woodside (June 24): Spring-brood moths are still emerging in small numbers at Staunton, in northwestern Virginia, but the flight is about over. Larvae began to leave fruit on June 16. Infestation is relatively light.
- Ohio. T. E. Parks (June 22): First-brood hatching and larval entrances near Columbus, in north-central Ohio, were delayed by unfavorable weather, so that the insect is not advanced over normal seasonal development. The earliest apples are being harvested but no larvae have left the apples. First-brood entrances are not numerous.
- Indiana. L. F. Steiner (June 9): Emergence from ground cages and tree bodies at Vincennes, in southwestern Indiana, reached one of the highest peaks of the season on June 6 and again on June 8. Eggs are hatching in large numbers, but the larvae have been less successful in entering unsprayed fruit during the last week than the week before. (June 23): Adults of the first brood were emerging by June 17 and emergence is picking up rapidly in the insectary from apples injured by the early first brood. This is reflected in the bait-trap catches of June 21 and 22.
- Missouri. L. Haseman (June 24): The prolonged cool, rainy weather throughout June has delayed emergence, reduced oviposition, and interfered with larvae reaching and entering the fruits. However, there has been a rather heavy hatch in some of the commercial orchards. Moths of the overwintering generation have practically all emerged throughout the State, and the earliest first-generation larvae have been leaving the fruit since the middle of June.
- Kansas and Missouri. H. Baker (June 24): Spring-brood moths were caught in bait traps in northeastern Kansas and northwestern Missouri in large numbers from May 16 to June 6, the peak catches being taken on May 20 and 25. Larval attacks reached their peak from May 28 to June 6. The first record of the exit of a mature larva from fruit was June 7 and the first record of emergence of a first-brood moth on June 21. First-brood damage in the area as a whole appears about normal, some orchards being very clean and others wormy.

Wisconsin. C. L. Fluke (June 21): The heaviest flight in 20 years has occurred at Gays Mills, Crawford County, in southwestern Wisconsin. First heavy flight occurred on June 3, next on June 6, and the third on June 9 and 10.

Minnesota. A. G. Ruggles (June): First adult at light trap in Ramsey County, in southeastern Minnesota, reported by J. Medler on June 9.

Washington. E. R. Van Leeuwen and E. J. Newcomer (June 18): The peak of emergence of spring-brood moths in Yakima County, in south-central Washington, occurred on May 15. The largest catches of moths in baits were made May 22 to 26. The first eggs were found on trees on May 9, the maximum number occurred from May 15 to 23, and many eggs are still being deposited. Larvae began entering the fruit on May 24, were entering in large numbers from June 3 to 9, and the first larva left the fruit on June 8.

EASTERN TENT CATERPILLAR (Malacosoma americana F.)

Vermont. H. L. Bailey (June 22): First cocoons at Montpelier, in central Vermont, on May 29, and the first adult in light trap on June 20.

Massachusetts. A. L. Bourne (June 24): Tent caterpillars have concluded feeding, and have shown a marked decline from their abundance of a year ago. This is the first time for several seasons that there has been any appreciable decline in abundance.

Rhode Island. A. E. Stone (June 9): Tent caterpillars have been scarcer than during any of the last four seasons.

Tennessee. G. M. Bentley (June 9): A few reported occurring on apple trees in an orchard at Madison, Davidson County.

EYE-SPOTTED BUDMOTH (Spilonota ocellana D. & S.)

Maine. F. H. Lathrop (June 22): Transforming to adults during the past week at Monmouth, Kennebec County, in south-central Maine.

Massachusetts. A. L. Bourne (June 24): A serious outbreak was discovered in an orchard in Middlesex County, in eastern Massachusetts.

FRUIT TREE LEAF ROLLER (Cacoecia argyrospila Walk.)

New York. N. Y. State Coll. Agr. News Letter (June): This insect is causing severe injury to apples and pears in western New York.

Missouri. L. Haseman (June 24): Codling moth bait jars at Columbia, in central Missouri, took hundreds of moths each night from June 1-15. There has been a definite falling off in numbers since June 15.

ROSY APPLE APHID (Anuraphis roseus Baker)

Connecticut. P. Garman (June 20): Migrating individuals appeared about 10 days ago in New Haven and Fairfield Counties, and most of the insects have left the trees.

New York. N. Y. State Coll. Agr. News Letter (June): The rosy apple aphid is more abundant and injurious generally than usual.

Virginia. W. A. Hough (June 24): Rosy aphid causing very serious damage, 10 to 40 percent, in unsprayed orchards in the vicinity of Winchester.

Missouri. L. Haseman (June 24): The rosy aphid continued injurious throughout the fore part of June, and infested fruits and twigs show the characteristic injury.

Indiana. J. J. Davis (June 13): Rosy apple aphid caused a large amount of damage, at least in southern Indiana, during the spring. At Orleans the aphids were being noticeably checked by natural enemies by May 6.

Colorado. J. H. Newton (June 20): Infestations in orchards of Delta County, in west-central Colorado, are more severe than in many seasons.

WOOLLY APPLE APHID (Eriosoma lanigerum Hausm.)

Ohio. E. W. Mendenhall (June 25): The woolly apple aphid is noticeable on apple trees in central Ohio.

Kentucky. M. L. Didlake (June 18): Woolly aphids are abundant on crab apple at Danville, in eastern Kentucky.

Iowa. C. J. Drake (June 25): Heavy infestations were reported at Oskaloosa, Mahaska County, just east of south-central Iowa.

WHITE APPLE LEAFHOPPER (Typhlocyba pomaria McAtee)

Maine. F. H. Lathrop (June 22): A few adults were present on June 10 at Monmouth, Kennebec County, and apparently all nymphs had transformed to adults by June 21. Apparently there has been a gradual increase in numbers on apple trees in this locality during the last two summers. The insect is not yet present in destructive numbers.

Massachusetts. A. L. Bourne (June 24): Has been very abundant in orchards scattered throughout the State, although less abundant in the first brood than last year.

Connecticut. P. Garman (June 20): Nymphs later than usual in appearing in New Haven County.

New York. N. Y. State Coll. Agr. News Letter (June 20): White apple leafhopper is appearing in injurious numbers in a few orchards in Dutchess and Rockland Counties, in the lower Hudson River Valley.

Pennsylvania. H. E. Hodgkiss (June 16): First-generation adults, last-instar nymphs, and newly hatched second-generation nymphs are present.

NEW YORK WEEVIL (Ithycerus noveboracensis Forst.)

Maine. F. H. Lathrop (June 22): These large weevils were reported doing severe injury to a young orchard at Farmington, Franklin County, in western Maine. Injury was most severe next to a growth of gray birch. The weevils destroyed the bark of the spurs and the new growth, causing the terminal growth to wilt and die.

APPLE CURCULIO (Tachypterellus quadrigibbus Say)

Missouri. L. Haseman (June 24): There has been a considerable sprinkling of apple curculios, more particularly throughout the central part of the State. Since June 20 the larvae have been pupating and an occasional adult has appeared in the breeding cages.

A WEEVIL (Phyllobius oblongus L.)

New York. N. Y. State Coll. Agr. News Letter (June 6): A heavy infestation was observed in an apple orchard south of Sodus, Wayne County, in western New York, on June 1. (June 13): A second infestation in Wayne County was noted on June 8.

APPLE FLEA WEEVIL (Orchestes pallicornis Say)

Indiana. L. F. Steiner (June 23): Serious damage is occurring in an orchard near Vincennes, where this pest has never been of any consequence.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

New York. N. Y. State Coll. Agr. News Letter (June 20): Flies just beginning to emerge in the Hudson River Valley, the first fly being collected from trap cages near Poughkeepsie on June 16, and the second on June 18. In Rockland County, the first adult was found on June 13.

A LEAF-ROLLING MIDGE (Dasyneura mali Kieff.)

New York. N. Y. State Coll. Agr. News Letter (June 13): The leaf-rolling midge on apples is noted in more orchards in Monroe County, in western New York, than in former years, and some growers near the place where it was first noted 2 years ago are quite alarmed.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Connecticut. P. Garman (June 21): Reports of browning have been received from several orchardists.

Pennsylvania. H. E. Hodgkiss (June 23): Very plentiful in eastern Pennsylvania, where apple foliage is beginning to bronze.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Maine. F. H. Lathrop (June 22): Emergence of adults from hibernation was later and extended over a longer period than last year at Monmouth, Kennebec County. Apparently the numbers of adults in the apple trees have reached a peak. Egg scars on young apples began to appear during the first 10 days in June.

Massachusetts. A. L. Bourne (June 24): The rather cool nights, particularly late in May and early in June, somewhat retarded the activity of the plum curculio.

Connecticut. P. Garman (June 20): Appeared to do damage in New Haven County later than usual, owing to cold weather earlier in the month.

New Jersey. H. W. Allen (June): In rather extensive collections of June drop peaches, made in Burlington County, first-generation grubs appear to be unusually abundant.

Delaware. L. A. Stearns (June 22): Overwintered adults taken in unusually large numbers by jarring weekly from April 6 to date. Mature first-brood grubs were leaving dropped peaches in greatest abundance the last week in May.

Virginia. W. J. Schoene (June 24): The plum curculio is developing about 10 days earlier than usual in the vicinity of Blacksburg, in southwestern Virginia, and a second brood is feared.

A. M. Woodside (June 24): Overwintered adults are still depositing a few eggs in the insectary at Staunton. First-brood adults began to emerge on June 22.

Georgia. O. I. Snapp (June 20): The infestation at Fort Valley is still lighter than that of an average year. The early and mid-season varieties of peaches have been harvested remarkably free from damage. Adults of the first generation began to emerge from the soil in the laboratory on May 24, 11 days earlier than the first emergence last year. Jarring in commercial peach orchards revealed a marked increase in adults on peach trees on May 27 and 28. Most of these were new beetles. Second-generation egg deposition began at Fort Valley on June 15, exactly 3 weeks earlier than last year. Late peaches will therefore be subjected to a second brood. Five percent of the first-generation female curculios had started to deposit eggs by June 18.

Tennessee. W. F. Turner (June 20): From two to five plum curculios were taken per quarter tree jarred in a peach orchard in Roane County, in eastern Tennessee, on June 16. Curculios were taken from every tree.

Missouri. L. Haseman (June 24): The plum curculio has been pupating at Columbia since June 20, although up to June 24 no adults have emerged in breeding cages.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (June 20): Scarce in most orchards early in the month. Infested tips apparent in many places.

New Jersey. W. P. Yetter, Jr. (May 21): Spring activity in Burlington County is 10 to 14 days earlier than it was in 1937. Cool, windy, dry weather has somewhat retarded activity as well as the twig growth, which, incidentally, is shorter and harder than usual at this time of the season. Twig injury is about normal, although the damage varies considerably between orchards. Larvae are already entering the small peaches.

Delaware. L. A. Stearns (June 25): Parasitism of twig-feeding, first-brood larvae is the highest recorded during the last 10 years (between 70 and 80 percent). Injury by second-brood larvae is at its peak.

South Carolina. O. L. Cartwright (June): All peach areas in South Carolina have developed a heavier infestation this season than last. Twig injury is especially noticeable in the Johnston-Ridge Spring section.

Georgia. O. I. Snapp (June 20): Second-generation larvae are attacking green peaches in home orchards at Fort Valley. The infestation is rather heavy in those orchards where there are late varieties. The insect is not present or is of no economic importance in the commercial orchards, as there are no late varieties of peaches in these orchards.

Kentucky. M. L. Didlake (June): Was much more abundant than last year, as reported from Lexington on May 28 and in western Kentucky on June 9.

Tennessee. G. M. Bentley (June 1 and 18): Oriental fruit moth causing twig injury to peach trees generally over the State.

Louisiana. C. O. Eddy (June): Oriental fruit moth reported from Grant Parish, in west-central Louisiana. Specimens were sent.

PEACH BORER (Conopia exitiosa Say)

Connecticut. P. Gannan (June 20): More abundant than for several years.

Georgia. O. I. Snapp (June 20): Peach orchards in the vicinity of Fort Valley have been examined regularly for peach borer cocoons since May 3. The first cocoon was found on May 26, which shows that pupation did not start unusually early. The first cast pupal skin was removed from a tree on May 23, 1937, and on May 9, 1936. Cocoon collections indicate a heavier pupation earlier this season than last. The infestation is about average.

Tennessee. W. F. Turner (June 20): Evidences of abundant injury noted in two orchards in Roane County on June 15 and 16.

BLACK PEACH APHID (Anuraphis persicae-niger Smith)

California. E. O. Essig (June): The black peach aphid was observed to pass the winter in the apterous stage on small twigs of peaches and plums at Berkeley. No forms were found upon the roots of a peach tree.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

Connecticut. M. P. Zappe (June 23): Appears to be rather scarce, even on unsprayed pears.

New York. N. Y. State Coll. Agr. News Letter (June): The pear psylla was only moderately abundant the first 3 weeks of June. However, hot weather at the end of the month hastened development, necessitating control measures in some orchards.

PEAR LEAF BLISTER MITE (Eriophyes pyri Pgst.)

Maine. F. H. Lathrop (June): An unusual number of reports of severe infestation on pears have been received from the southern part of the State.

CHERRY

BLACK CHERRY APHID (Myzus cerasi F.)

New York. D. W. Hamilton (June 24): Black cherry aphids are more numerous on both sweet and sour cherries than they were in 1937 in the Hudson River Valley.

N. Y. State Coll. Agr. News Letter (June): The black cherry aphid is abundant in Niagara and Orleans Counties, in western New York.

Maryland. E. N. Cory (June 4): Black cherry aphid reported attacking cherry at Baltimore.

CHERRY FRUITFLIES (Rhagoletis spp.)

New York. D. W. Hamilton (June 24): First adults of R. fausta O. S. were observed in emergence cages at Poughkeepsie, in Columbia County, on May 31. Peak emergence appeared on June 4 and 5. Last fly emerged on June 14. This species is seldom noticed in sprayed orchards, but is quite noticeable in neglected plantings. The first adults of R. cingulata Loew were taken in emergence cages at Poughkeepsie on June 4. Heavy emergence began on June 13 and has continued to the present time, although the daily number of flies taken has fallen off slightly since June 22.

N. Y. State Coll. Agr. News Letter (June): Emergence of R. fausta began at Geneva on May 28.

Oregon. D. C. Mote (June): Emergence of R. cingulata began on June 1, and first eggs were found on June 17 in the Willanette Valley.

PEAR SLUG (Eriocampoides limacina Retz.)

Ohio. T. H. Parks (June): The cherry slug is much more abundant than usual in the vicinity of Columbus. No complaints have been received from commercial plantings.

Utah. G. F. Knowlton (June 24): Cherry slugs are damaging cherry foliage in Riverdale and Centerville, both in north-central Utah.

A SAWFLY (Neurotoma inconspicua Nort.)

Tennessee. G. M. Bentley (May 23): Plum sawfly found affecting cherry in Nashville, Davidson County.

CHERRY LEAF MINER (Profenusa collaris MacG.)

New York. D. W. Hamilton (June 24): Injury was quite noticeable in one of the large plantings of scurs near Hudson on May 28. The infestation appeared to have spread from a few localized spots noticed the previous season. Practically all larvae had left the leaves by June 2.

PLUM

PLUM GOUGER (Anthonomus scutellaris Lec.)

Wisconsin. C. L. Fluke (June 21): Plum gouger appeared in large numbers in the University orchard, Dane County, in south-central Wisconsin, on June 1.

RASPBERRY

RASPBERRY FRUITWORM (Byturus unicolor Say)

Massachusetts. A. L. Bourne (June 24): Several instances of rather severe injury have been brought to our attention. In plantings visited the insect was more abundant than usual, and this condition seems to be true throughout the State.

Idaho. B. J. Landis and W. W. Baker (June 6): Adults were found on raspberry west of Post Falls, and at Hayden Lake, Kootenai County, in northern Idaho.

Washington. B. J. Landis and W. W. Baker (June 6): Adult beetles were found on raspberry from the eastern limits of Spokane to the Idaho State line.

Oregon. B. J. Landis, and W. W. Baker (June 4): Adults were found on raspberry at La Grande and Elgin, Union County, and at Wallowa, Wallowa County, in northeastern Oregon.

RASPBERRY SAWFLY (Monophadnoides rubi Harr.)

Michigan. R. Hutson (June 22): The raspberry sawfly is common about Lansing, Grand Rapids, Paw Paw, South Haven, Bangora, and Niles, in southern Michigan.

GRAPE

GRAPE LEAF FOLDER (Desmia funeralis Hbn.)

California. G. H. Kaloostian (June 15): In Fresno County, the grape leaf folder is increasing around the Fowler district and appears to be about the same as last year in the Parlier district, but in the Sanger district it is very much below the average year. The first brood of larvae is about two-thirds grown.

EIGHT-SPOTTED FORESTER (Alypia octomaculata F.)

Nebraska. M. H. Swenk (June 22): Caterpillars on woodbine and grapevines reported from Saunders, Platte, and Holt Counties, in eastern Nebraska, on June 17 and 20.

GRAPE PLUME MOTH (Oxyptilus periscelidactylus Fitch)

Massachusetts. A. L. Bourne (June 24): The grape plume moth has been unusually abundant and very generally distributed throughout the State.

A CANE GIRDLER (Ampelogypter ater Lec.)

Massachusetts. A. L. Bourne (June 24): The grape cane girdler is very abundant in eastern Massachusetts, but has not been conspicuous in vineyards in the western half of the State.

GRAPE TOMATO GALL (Lasioptera vitis O. S.)

Maryland. E. N. Cory (June 22): The grape tomato gall was observed at Annapolis, Anne Arundel County, in Baltimore County, and in Charles County during June.

CURRENT

IMPORTED CURRENT WORM (Pteronidea ribesii Scop.)

Michigan. R. Hutson (June 22): Imported current sawfly is common about Shelby.

North Dakota. J. A. Munro (June 21): Imported current worm abundant in the vicinity of Fargo, in southeastern North Dakota.

CURRENT SPANWORM (Itane ribearia Fitch)

South Dakota. H. C. Severin (June): The current spanworm has occurred locally in outbreak numbers in several areas of the State, and frequently devoured current and gooseberry bushes before the owners discovered their presence.

CURRENT APHID (Capitophorus ribis L.)

South Dakota. H. C. Severin (June): The currant aphid is exceptionally abundant and has done considerable damage to currants.

PECAN

PECAN NUT CASEBEARER (Acrobasis caryae Grote)

Oklahoma. F. A. Fenton (June 23): Pecan nut casebearer reported from Okemah, in east-central Oklahoma.

Texas. C. B. Nickels (June 21): Examinations were made to determine infestation in three orchards at Crystal City and one orchard at Eagle Pass, both in southeastern Texas, on June 1 and 2, respectively. From 50 to 95 percent of the total nut crop was destroyed by first-generation larvae.

E. W. Laake (June 20): One infestation in the vicinity of Dallas reported since June 1.

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Mississippi. G. L. Bond (June 24): Injury reported as noticeable on many pecan trees along the coast.

Missouri. L. Haseman (June 24): The first moths began emerging at Columbia during the last days of May and the first days of June. Numerous males were taken at light traps for several successive days, but practically none of the female moths came to the light traps. The first hatch of worms was observed between June 15 and 20, and now the oldest caterpillars are approximately one-half inch long and apparently in the second instar, though a few may already have reached the third instar. On this date some packets of eggs are still hatching. The eggs show from 2 to 20 percent parasitism by a small, yellowish hymenopterous parasite. Common paper wasps are feeding on them, as well as nymphs of an undetermined pentatomid. An undetermined species of ichneumon was found today, vigorously parasitizing second- or third-instar larvae. From 10 to 20 colonies of worms, varying from 500 to 1,000 worms per colony, have been taken from a single walnut tree. Both hickory and black walnut trees are infested.

Oklahoma. F. A. Fenton (June 23): Walnut datana at Stillwater, in north-central Oklahoma, and at Wynnewood, in south-central Oklahoma.

C. F. Stiles (June 22): The walnut datana has made its appearance over the State, but not in as large numbers as last year. Some of the eggs are parasitized and predaceous insects feed on the larvae.

R. G. Dahms (June 23): This insect is defoliating pecan trees in many localities in southwestern Oklahoma.

Texas. C. B. Nickels (June 21): A severe infestation was observed by W. C. Pierce in one pecan orchard near Comanche, in north-central Texas, on June 20.

FALL WEBWORM (Hyphantria cunea Drury)

Georgia. O. I. Snapp (June 13): Nests of first-generation fall webworms, about half grown, are common on pecan trees at Fort Valley. They appeared a little earlier than the first generation of 1937.

Mississippi. C. Lyle (June 24): Webs reported as quite numerous in pecan trees in the vicinity of Moss Point, in southeastern Mississippi. These insects are also beginning to appear in trees in the vicinity of Starkville and State College, in the northeastern part of the State.

PECAN BUDMOTH (Gretchena bolliana Sling.)

Texas. C. B. Nickels (June 21): A heavy infestation in a young pecan orchard reported from Blanco, in south-central Texas, on June 20.

CITRUS

GREEN CITRUS APHID (Aphis spiraecola Patch)

Florida. H. Spencer (June 7): In the upper east coast district, rains have brought on a flush of growth on which the green citrus aphids were developing quite an infestation.

CITRUS MEALYBUG (Pseudococcus citri Risso)

Florida. H. Spencer (June 20): Complaints are coming in of infestations in the central section of Florida and on the Gulf coast. There is some interest among growers in the possibility of utilizing Cryptolaemus for control.

FLORIDA RED SCALE (Chrysomphalus aonidum L.)

Florida. H. Spencer (June 20): During May and June numbers of newly hatched scales have settled on grapefruit and orange leaves, in central Florida and on the east coast.

WHITEFLIES (Dialeurodes spp.)

Florida. H. Spencer (May 31): Many eggs of the citrus whitefly, D. citri Ashm., were being laid during the last week of May in central Florida. A few adults and eggs of the cloudy-winged whitefly, D. citrifolii (Morg.), were found on new-growth leaves on nursery plants in the same section.

J. R. Watson (June 22): The summer brood of D. citri is beginning to fly at Gainesville, in northern Florida.

TRUCK CROP INSECTS

SEED-CORN MAGGOT (Hylemyia cilicrura Rond.)

Maine. J. H. Hawkins (June 19): Reported on beans at Monmouth, in the southwestern part of the State.

Massachusetts. A. L. Bourne (June 24): We have had at least two reports of rather serious injury to plantings of lima beans. Undoubtedly this injury was somewhat aggravated by the slow germination.

Connecticut. A. W. Morrill, Jr. (June): Reported from Hartford County on tobacco, newly set in the field. The pests appeared on May 25 in heavier abundance than usual in some fields, but are not much more prevalent in the valley as a whole. Attacked plants in a few scattered shade tents on several acres in the vicinity of Hartford early in the month and late in May. Counts showed considerably less infestation in second setting where treatment was applied. After third setting the insects disappeared and did not appear again, which is the usual experience with this pest.

Indiana. J. J. Davis (June 4): Corn-seed maggot reported abundant, attacking corn-seed plantings at Goshen on June 4.

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

Massachusetts (June 24): This pest appeared approximately on June 4 to 6, and has been very abundant.

Connecticut. N. Turner (June 22): Serious damage to untreated fields of squash and melons in all parts of the State. Emergence lasted over a long period.

Pennsylvania. H. E. Hodgkiss (June 7): The striped cucumber beetles are causing serious damage to vegetables in the eastern counties.

Ohio. N. F. Howard (June 23): Striped cucumber beetles are still numerous on squash, melons, and cucumbers at South Point and are spreading wilt.

Indiana. G. E. Gould (June 23): Damage to cucumbers and melons has been reported from many localities.

Kentucky. M. L. Didlake (June): This pest destroyed half of a cantaloup and cucumber planting at Lexington on May 28. Riddled petals of Platycodon and Philadelphus were observed at Lexington on June 20. They seemed to attack only white flowers in the garden. Melons were damaged at Lexington on June 23.

Missouri. L. Haseman (June 24): Numerous complaints during June have been received throughout the State but at Columbia considerable numbers of striped cucumber beetles began to show up in gardens about June 15.

- North Dakota. J. A. Munro (June 21): Striped cucumber beetles are very abundant on cucurbits in the vicinity of Fargo.
- South Dakota. H. C. Severin (June): Striped cucumber beetles are doing much damage to cucurbits and, unless controlled, make it almost impossible to raise cucumbers, melons, and squashes.
- Nebraska. M. H. Swenk (June 22): Complaints of damage to cucurbit plants came from Buffalo and Redwillow Counties on June 3 and 9, respectively.
- Kansas. H. R. Bryson (June 25): Striped cucumber beetles are quite abundant and cause considerable damage to young melons, squashes, and cucumbers. Reports of abundance have come from Manhattan, Belle Plain, and Burrton, all in the eastern half of the State.
- Texas. R. K. Fletcher (June 17): This pest was reported as being present on cucumbers in Galveston County.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

- Pennsylvania. H. E. Hodgkiss (June 7): The spotted cucumber beetles are causing serious damage to vegetables in the eastern counties.
- Kentucky. M. L. Didlake (June 10): Spotted cucumber beetles are reported ruining a planting of gourds at Louisville.
- Tennessee. G. M. Bentley (June 4): Spotted melon beetle found injuring watermelons, cucumbers, and squash at Waverly, Humphreys County.
- Missouri. L. Haseman (June 24): During the month many complaints have been received throughout the State, but at Columbia spotted cucumber beetles did not begin to show up in considerable numbers in gardens until about June 15.

BLISTER BEETLES (Meloidae)

- Georgia. S. B. Fenne (June 22): Severe injury by black blister beetles (Epicauta pennsylvanica Deg.) to potatoes in Fannin and Union Counties.
- Mississippi. C. Lyle (June 24): Specimens of Macrobasis unicolor Kby. were sent in from Sardis, Panola County, on June 6 with a report that they had caused severe injury to potato plants. (June 24): E. lemniscata F. reported causing damage in gardens in Panola, Grenada, and De Soto Counties, in the northwestern part of the State.
- Arkansas. D. Isely (June 22): There has been a general outbreak of blister beetles over the northern half of the State. The striped blister beetle (E. vittata F.) is the species most frequently referred to.

Nebraska. M. H. Swenk (June 22): Blister beetles were reported from Thayer County on June 20, as beginning their annual injury to potatoes. The first reports of injury to potatoes by M. segmentata Say were received from Holt County on June 16 and from Platte County on June 18 both in the eastern half of the State.

Kansas. H. R. Bryson (June 17): Blister beetles, Epicauta sp., are abundant. Rank growths of weeds have provided food for large numbers of them. Reports of injury to garden crops have been received from various parts of the State.

Oklahoma. F. A. Fenton (June 23): Blister beetle, E. vittata, reported near Earlsboro. M. torsa Lec. appeared at Perry, Hammon, and Wynnewood, in central and west-central Oklahoma.

Texas. S. B. Fenne (June 22): While driving near Houston, observed a large number of striped blister beetles (E. vittata) flying around lights.

FLEA BEETLES (Halticinae)

Nebraska. M. H. Swenk (June 22): The western cabbage flea beetle (Phyllotreta pusilla Horn) was found attacking cabbage plants in Platte County on June 2.

Colorado. R. L. Wallis (June 21): Pale-striped flea beetles (Systema taeniata Say) are damaging young cantaloups, beans, and sugar beet plants at Grand Junction, in west-central Colorado. It has been necessary to replant cantaloups in some fields.

Utah. G. F. Knowlton (June 17): The banded flea beetle (S. taeniata) is seriously damaging young pole beans at Garland, Box Elder County.

GREEN PEACH APHID (Myzus persicae Sulz.)

Pennsylvania. H. E. Hodgkiss (June 7): This pest is reported as very destructive on beets in the Philadelphia area.

California. E. O. Essig (May): The green peach aphid was found very abundant upon young tomato transplants in San Joaquin County in May but did not seriously injure the growth.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Texas. R. K. Fletcher (June 17): This pest was reported as seriously injuring beans, peas, and tomatoes in Liberty and Cherokee Counties, in eastern Texas.

BUFFALO TREEHOPPER (Ceresa bubalus F.)

Missouri. L. Haseman (June 24): Numerous complaints have been received in June regarding nymphs attacking tomatoes, potatoes, cucumbers, flowers, and other herbaceous plants. Since June 20 some have reached the adult stage and have been found feeding and harboring on various plants, including flowers, fruit trees, and sunflowers.

A CAMEL CRICKET (Daihinia brevipes Hald.)

Nebraska. M. H. Swenk (June 22): In the area from Sheridan, Morrill, and Keith Counties east through the sandhills to Hooker County, an unusual abundance of the camel cricket has been repeatedly reported from June 15 to date. Observers familiar with this insect, have commented on its conspicuousness everywhere in the region.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Connecticut. N. Turner (June 22): Larvae are feeding on potatoes in the southern part of the State. They have not been serious for several years.

Delaware. L. A. Stearns (June 10): Injury to newly set tomato plants reported as serious throughout Sussex County.

Florida. E. W. Berger and G. B. Merrill (June 23): Reported in moderate abundance on eggplant in two small patches within the city limits of Gainesville.

Ohio. N. F. Howard (June 23): On June 23 the potato beetle was reported as normally abundant at South Point, necessitating control measures.

Michigan. R. Hutson (June 22): Colorado potato beetle is very common all over the Lower Peninsula.

Tennessee. G. M. Bentley (May 27): A slight infestation found on potatoes in Warren County.

Kansas. H. R. Bryson (June 25): Abundant but not causing much injury.

Idaho. R. W. Haegle (June 18): Infestations on potatoes are widespread and very bad in southwestern Idaho in many districts, especially in Canyon County. It has been 2 or 3 years since potato beetles have appeared here in damaging numbers.

Utah. G. F. Knowlton (June 16): A few adults were found on potato foliage at Clinton, in Davis County. This is the first observance or report this season. (June 20): Mature larvae and adults found on potato vines at Harrisville, in Weber County, recently. These beetles have been scarce on potatoes to date, in the small area infested. (June 24): Injury observed on potatoes at Marriott and West Ogden.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Maine. J. H. Hawkins (June 21): Reported as increasing in abundance on tomato and potato in central Maine.

Connecticut. N. Turner (June 22): Serious damage to tomato plants in several parts of the State. Unsprayed potatoes also show serious feeding.

Georgia. S. B. Fenne (June 20): Potato flea beetles in fields where control measures were not applied in Union, Fannin, Towns, Gilmer, and Rabun Counties. Leaves were literally riddled, causing stunting and deformed top.

Ohio. T. H. Parks (June 22): Injury to potatoes is severe in some early plantings in the central part of the State.

Nebraska. M. H. Swenk (June 22): Reported attacking potato and tomato plants, the first report coming on June 6 from Franklin County, where the insects were damaging tomato plants.

California. J. Wilcox (June 1): Potato flea beetle (Epitrix sp.) on tomato plants in seedbed at Tustin, Orange County, damaged about 40 percent.

CORN EAR WORM (Heliothis obsoleta F.)

South Carolina. J. G. Watts (June): Damage in commercial tomato fields at Ehrhardt and Blackville was sufficient to cause considerable concern during the first 10 days of June, but since then the damage has been decreasing.

Georgia. O. I. Snapp (June 2): The tomato fruitworm has begun to attack small green tomatoes in a commercial planting at Byron, in central Georgia.

Ohio. R. L. Nelson (June 15): At South Point a few larvae were noted in the green fruit of tomatoes. One nearly full-grown specimen was found, the remainder being second and third instar.

POTATO TUBER WORM (Gnorimoschema operculella Zell.)

California. J. Wilcox (June 8): About 20 percent of the new crop of potatoes was infested when dug at Costa Mesa, Orange County.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

California. J. C. Elmore (June 20): The tomato pinworm is common as a leaf folder on young tomato plants in Orange, Los Angeles, and Ventura Counties, in southern California. An early field near Santa Ana, Orange County, has a 30-percent infestation of the fruit from the first pickings.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Georgia. S. B. Fenne (June 22): Infestation in the northern part of the State is not so severe as in previous years, according to growers.

Ohio. T. H. Parks (June 18): Adults and nymphs are now common on potatoes planted near a bean patch on the university farm at Columbus. This is early for nymphs to appear on potatoes.

POTATO PSYLLID (Paratrioza cockerelli Sulc.)

Nebraska. M. H. Swenk (June 22): The potato and tomato psyllid is unusually numerous in the potato fields of western Nebraska. Complaints of damage to tomato plants have been received, the first coming from Chase County on June 7.

Utah. G. F. Knowlton (June 23): A few of the insects are present generally on potatoes.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Massachusetts. C. N. Smith (June 13): This pest was found causing heavy damage to beans at Vineyard Haven, on Marthas Vineyard.

Connecticut. N. Turner (June 22): Locally very abundant. Overwintering adults have caused serious damage to beans but no larvae have been found.

New York. N. Y. State Coll. Agr. News Letter (June): The first egg masses on Long Island were found on June 6. They were observed hatching by June 20.

Delaware. L. A. Stearns (June 10): Abundance and injury about average in Sussex County.

Maryland. E. N. Cory (June 22): Continued to emerge through the State over a long period. On June 10 the beetles were still appearing in fields near Salisbury and for the first time did such severe damage to bush lima beans that some fields were plowed under.

South Carolina. J. N. Todd (June): Cage emergence of hibernating beetles at Clemson was 16.1 percent for the season. Heaviest migration from hibernation to bean fields occurred the first week in June.

J. G. Watts (June 20): Damage in home gardens in Barnwell County is increasing.

Ohio. R. H. Nelson (June 15): At South Point, first-generation adults have not yet appeared. Beans coming up during the last week or so are very lightly infested. Early beans are showing injury in certain areas, but not generally severe.

Indiana. G. E. Gould (June 23): This insect is more common than at this time last year.

Michigan. R. Hutson (June 22): Are injuring gardens in Detroit.

Tennessee. G. M. Bentley (June 1): Heavy infestations found at McMinnville, Warren County.

L. B. Scott (June 18): Present in slightly more than normal numbers in the north-central part of the State. Damage is severe in some fields.

Kentucky. M. L. Didlake (June 21 and June 23): The insects were abundant at Versailles on June 21 and at Lexington on June 23.

Mississippi. C. Lyle (June 24): Specimens accompanied by complaints of severe damage to beans have been received during the last month from numerous localities in the eastern third of the State as far south as Forrest County.

Louisiana. C. O. Eddy (June 19): Specimens, including eggs, larvae, pupae, and adults, arrived from Bogalusa, in Washington Parish, on June 20.

Arkansas. D. Isely (June 22): Has been found in Mississippi County, north-eastern Arkansas, infesting garden beans near Osceola.

Colorado. R. L. Wallis (June 21): The emergence of the beetles in hibernating cages has been approximately 25 percent to date. Beetles are appearing in numbers in the bean fields of Grand Valley, in west-central Colorado.

Utah. G. F. Knowlton (June 20): Beetle injury is reported as just beginning at Westwater, Grand County.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Ohio. E. W. Mendenhall (June 25): This insect is quite abundant on beans in the vicinity of Columbus.

Virginia. A. M. Woodside (June 24): The bean leaf beetle is causing serious damage to beans in the Staunton vicinity.

Mississippi. C. Lyle (June 24): G. L. Bond reports injury to beans and peas in the vicinity of Moss Point, in Jackson County. Larvae of this species, found in the roots of cowpeas, were sent in from Ethel in Attala County, in central Mississippi, on June 22.

BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

Florida. J. R. Watson (June 24): Reported to be severely injuring beans in Pinellas County.

Texas. J. N. Roney (June 17): Reported on corn, beans, rutabaga, tomato, and cucumbers in Galveston County.

A BEETLE (Strigoderma arboricola F.)

New York. S. W. Bromley (June 22): Two specimens recently sent in from Westchester County. No host mentioned. (Det. by E. A. Chapin.)

Virginia. L. W. Brannon (June 15): This insect was observed in large numbers at Norfolk in several snap-bean fields, feeding on the blossoms. Blossoms were being severely damaged in some parts of the fields. The insect was also feeding on smartweed blossoms on the edges of the fields.

COWPEA CURCULIO (Chalcodermus aeneus Boh.)

Georgia. T. L. Bissell (June 22): This weevil is inflicting considerable damage to snap beans left at Tifton, after the main part of the crop had been harvested. The beans do not have many eggs and larvae, but the pods are greatly disfigured by adult feeding punctures. The earliest grubs observed were found in pods on June 2.

CITRUS ROOT WEEVIL (Pachyneus opalus Oliv.)

Florida. J. R. Watson (June 22): This weevil was bred out on beans from the roots of which the larvae were collected. These beans were inter-planted in a pecan orchard. However, I think this is the first instance of this insect's being able to complete its life history on a plant like bean.

A THRIPS (Frankliniella insularis Frankl.)

Florida. J. R. Watson (June 24): Sent in from Pinellas County, where it was reported to be doing considerable damage to beans. Though widespread in the southern half of the State, this is the first instance of any really serious damage being done by this West Indian thrips.

BEAN APHID (Aphis rumicis L.)

Nebraska. M. H. Swenk (June 22): Reported from Platte County on June 2, seriously injuring bean plants.

PEAS

PEA APHID (Illinoia pisi Kltb.)

Maine. J. H. Hawkins (June 21): More abundant on both clover and peas in Waldo County than at the same time last year. Also attacking alfalfa.

Connecticut. N. Turner (June 22): Very few aphids seen on peas as yet.

New York. New York State Coll. Agr. News Letter (June): The pea aphid has failed to develop into injurious numbers.

Nebraska. M. H. Swenk (June 22): Complaints of damage received from June 4 to 14 from Sarpy, Butler, Sherman, and Franklin Counties.

Utah. G. F. Knowlton (June 11): Seriously damaging some canning pea fields in northern Utah areas on June 11, 85 percent of one field at Murray being destroyed. In some fields populations of pea aphids have been decreasing lately. (June 23): Abundance has decreased in most canning fields in northern Utah during the last 10 days.

CABBAGE

IMPORTED CABBAGE WORM (Pieris rapae L.)

Connecticut. N. Turner (June 22): First-generation adults flying. No serious damage to unsprayed fields of cabbage and cauliflower.

Maryland. E. N. Cory (June 13): Adults flying and laying eggs in great abundance and the first larvae have hatched in Baltimore County.

Missouri. L. Haseman (June 24): During the latter half of June there seem to be an increase in cabbage worms at Columbia.

CABBAGE APHID (Brevicoryne brassicae L.)

Ohio. E. W. Mendenhall (June 25): Doing some damage to cabbage plants in Franklin County.

Nebraska. M. H. Swenk (June 22): Inquiries as to the control of this pest on radish, turnip, and related vegetables received from Franklin County on June 6 and 9.

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Utah. G. F. Knowlton (June 11): Adults abundant around trap lights at Logan, and larvae on mustards throughout northern Utah. Injury to cabbage has just begun.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Ohio. N. F. Howard (June 23): At South Point the bug is not present in injurious numbers. Eggs are rather numerous on kale.

Tennessee. L. B. Scott (June 18): Pest present in more than normal numbers in north-central Tennessee. Many reports of damage to cabbage and turnips have been received, but the damage is moderate.

Mississippi (June 24): A heavy infestation on cauliflower, radish, and turnip plants observed in a garden at State College on May 25. These insects were reported as abundant on mustard and turnips from Collins, Covington County, on May 27.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Ohio. N. F. Howard (May 26): Adults were taken on young squash on the experimental plots at Columbus.

Louisiana. C. O. Eddy (June): Squash bugs have been reported from many localities during June.

Nebraska. M. H. Swenk (June 22): Squash bugs damaging pumpkin vines were the subject of complaint by a Sarpy County correspondent on June 14.

Kansas. H. R. Bryson (June 17): The squash bugs are plentiful wherever squashes or pumpkins are being grown. Reported abundant at Ottawa and Manhattan.

California. R. E. Campbell (June 1): Adults have been observed in fields of banana and Hubbard squash in the San Fernando Valley.

(June 20): At El Monte, Los Angeles County, squash bugs are attacking cream squash and table queen squash, varieties which in previous years have been immune to attack.

MELONS

MELON APHID (Aphis gossypii Glov.)

Kansas. H. R. Bryson (June 25): Reported abundant at Neosho Falls, in southeastern Kansas.

California. R. E. Campbell (June 2): This aphid was causing considerable trouble last week in the Turlock-Merced area, in central California.

PICKLEWORM (Diaphania nitidalis Stal)

Mississippi. C. Lyle (June 24): G. L. Bond of Moss Point reports pickleworm damaging cantaloups in that section of the State. They are appearing in numbers at State College.

Louisiana. C. O. Eddy (June): The pickleworm, attacking cucumbers, has been sent in from Allen Parish.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

Massachusetts. A. L. Bourne (June 24): Asparagus beetles appeared slightly later than usual and were considerably less abundant than they were last year in western Massachusetts, where they were a more serious pest than they had been for many years.

New York. R. W. Leiby (May and June): In western New York the common asparagus beetle is heavily parasitized by a hymenopteron, Tetrastichus asparagi Crawford, in Monroe, Wayne, and Oswego Counties.

Idaho. R. W. Haeghele (June 22): This is the first record of the occurrence of the asparagus beetle in Idaho. It was taken in gardens at Nampa, Canyon County.

Utah. G. F. Knowlton (June 4): Larvae have been abundant at Clearfield and Roy wherever control measures were not applied. The predator Perillus bioculatus F. has been observed to feed on the larvae at Riverdale.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Connecticut. N. Turner (June 22): Locally abundant, but much less damage than on the same date last year.

California. H. J. Ryan (June 22): An unusually heavy infestation noted during the month on asparagus in the San Fernando Valley.

ONION MAGGOT (Hylemyia antiqua Meig.)

Oregon. D. C. Mote (June): Onion maggots doing considerable damage in the Labish region in northwestern Oregon. Pupae found on June 14.

HOPS

HOP APHID (Phorodon humili Schr.)

Oregon. D. C. Mote (June): Ten-percent emergence of this aphid at Corvallis, where it is infesting hop leaves.

SPINACH

SPINACH LEAF MINER (Pegomya hyoscyami Panz.)

Connecticut. N. Turner (June 22): Two acres of spinach in Hartford County have about 25 percent of the plants infested, the first commercial damage seen on spinach for several years.

SWEETPOTATO

TORTOISE BEETLES (Metritona spp.)

Indiana. J. J. Davis (June 13): Sweetpotato tortoise beetles, M. bicolor F. and M. bivittata Say, have been reported as destructively abundant on sweetpotatoes in several localities in the northern half of the State.

Mississippi. C. Lyle (June 24): Specimens of M. bivittata received from Laurel, Jones County, on June 22, with a report that they were moderately abundant on sweetpotato plants.

SWEETPOTATO LEAF BEETLE (Typophorus viridicyaneus Crotch)

North Carolina. L. W. Brannon (June 20): First adults of the season collected in field on May 24, 17 days earlier than the first beetle was found in 1937. First eggs deposited in the insectary on June 8, and hatched on June 19.

STRAWBERRY

STRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

Indiana. J. J. Davis (June 13): The insect has been more than usually abundant, judging from numerous reports, beginning the last of May and continuing to the present, and indicating general infestation for

central and northern Indiana.

Utah. G. F. Knowlton (June 23): Larvae and some pupae are abundant in some older fields in northern Utah, but rather scarce in others. Quite a number are parasitized.

A LEAF ROLLER (Anacampsis fragariella Busck)

Oregon. D. C. Mote (June): Pupae found at Corvallis on June 13.

STRAWBERRY FRUITWORM (Cnephasia longana Haw.)

Oregon. D. C. Mote (June): First pupa found on May 27, first adults on June 7, and first eggs on June 15, in the Willamette Valley.

STRAWBERRY WEEVIL (Anthonomus signatus Say)

Maryland. E. N. Cory (June 22): Present generally in the State. Crop severely damaged.

Delaware. H. W. Allen (June): Injury by an insect, known locally as "the clipper," presumably this species, was found to be so severe in some fields in the vicinity of Bridgeville, in southwestern Delaware, at the end of May that growers reported the harvesting of less than half the normal crop.

STRAWBERRY ROOT WEEVILS (Brachyrhinus spp.)

Utah. G. F. Knowlton (June 24): Adults of B. ovatus L. and B. rugosostriatus Goeze were abundant in a strawberry patch damaged by larvae at Willard, Box Elder County. (June 25): Ninety percent of the B. rugosostriatus were adult and 10 percent pupae in fields damaged severely at Orem and Pleasant Grove. Nearly all B. ovatus were adult also.

A LEAF BEETLE (Timarcha intricata Hald.)

Oregon. D. C. Mote (June): Larvae sent in from Marion County in northwestern Oregon, on June 4.

A CARRION BEETLE (Silpha ramosa Say)

Washington. B. J. Landis and W. W. Baker (June 3): Adult beetles were attacking strawberries in a small garden northeast of Naches, Yakima County. Said to have been extremely abundant in 1937.

EARLY STRAWBERRY SLUG (Empria fragariae Rohw.)

Nebraska. M. H. Swenk (June 22): Found attacking strawberry leaves in Holt County on May 23.

MILLIPEDES (Diplopoda)

Ohio. T. H. Parks (May 24 and June 3): Complaints were received from Hamilton County on May 24, and Lucas County on June 3, that strawberries were be-

ing fed upon by worms submitted for identification and found to be millipedes. Extensive injury was being caused by the millipedes burying the fore parts of their bodies in the ripening berries and eating holes in them. Not encountered before.

RHUBARB

RHUBARB CURCULIO (Lixus concavus Say)

Indiana. J. J. Davis (May 24): Reported doing considerable damage to commercial plantings of rhubarb at Logansport on May 24.

Tennessee. G. M. Bentley (June 3): Reported on rhubarb at Johnson City, Washington County.

A PENTATOMID (Euschistus inflatus Van D.)

Utah. G. F. Knowlton (June 2): Adults are extremely abundant around the bases of rhubarb stocks, preventing growth and resulting in seriously weakened plants at Riverdale.

TOBACCO

HORNWORMS (Protoparce spp.)

South Carolina. J. G. Watts (June): This insect, P. sexta Johan, occurred in most places on tomato, along with the tomato fruitworm, in Barnwell and Darke Counties, in the southwestern part of the State, causing control measures to be taken in some fields.

Tennessee. G. M. Bentley (June 4): Adults of P. sexta and P. quinquemaculata Haw. were commonly taken flying by night in central and eastern Tennessee.

L. B. Scott (June 15): The hornworms P. sexta and P. quinquemaculata appeared about 2 weeks earlier than usual but the infestation is below normal. It is believed that low night temperatures have delayed emergence.

TOBACCO BUDWORM (Heliothis virescens F.)

Tennessee. G. M. Bentley (June 8): Found doing severe injury to tobacco at Joelton, Davidson County. Many replantings had to be made.

Iowa. C. J. Drake (June 25): Reported from Buffalo Center, Winnebago County, and Ames, Story County, on groundcherries. This insect breeds on wild groundcherry, as well as on cultivated varieties, and is a pest of considerable importance.

A WEBWORM (Crambus sp.)

Tennessee. L. B. Scott (June 18): Crambids caused severe damage to tobacco planted on land which was idle in 1936 and 1937. In the north-central part of the State many fields required replanting of 90 percent of the original plantings. A few fields were abandoned.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Connecticut. A. W. Morrill, Jr. (June 6): Potato flea beetles attacked newly set tobacco, in many cases with unusual severity, from May 23 to 31, particularly in the vicinity of potato fields in Hartford County. Leaves were riddled and in some fields considerable resetting was necessary. The attack diminished after control measures had been applied. The lull between broods is now in progress and little damage has been seen since June 3.

TODACCO THRIPS (Frankliniella fusca Hinds)

Connecticut. A. W. Morrill, Jr. (June): Those insects appeared within 2 days after setting (24 hours in one case) on shade tobacco in Hartford County and seemed to be increasing rapidly during June, despite heavy rains in the first half of the month. The early appearance is unusual, and they are being found in appreciable numbers in some fields that have not had them for several years. It seems likely that this insect will be able to do some commercial damage unless the season is unusually wet, as it was last year.

A WHITEFLY (Aleyrodidae)

Florida. F. S. Chamberlin (June 14): An undetermined whitefly is causing serious injury in a crop of shade-grown tobacco in Gadsden County and has been found in lesser numbers in several other tobacco crops.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. J. G. Watts (June): Infestation is rather general over the Blackville section, but not serious.

F. F. Bondy (June 25): In Florence County, northeastern coastal plain, in 16 untreated plots the infestation averaged about 5 percent. The damage seems to be the worst in the past several years.

Georgia. P. M. Gilmer and P. A. Glick (June 19): At Tifton, in southern Georgia, the infestation in Sea Island cotton is quite heavy and a few fields of upland cotton show a heavy infestation. First-brood weevils are beginning to emerge.

W. L. Lowry (June 25): In Lowndes and Echols Counties square examinations in both poisoned and unpoisoned fields showed little or no increase in infestation during the past 3 weeks.

Florida. C. S. Rude and L. C. Fife (June 25): The infestation is heavier than it was a year ago. Last year the average infestation in 21 fields was 8.4 percent as compared with 29 percent in the 15 fields examined this year.

Mississippi. C. Lyle (June 24): According to reports, the infestation over the State is considerably higher this year than during the last 2 years.

R. L. McGarr (June 25): At State College, in east-central Mississippi, inspections of 8,400 squares in 25 untreated plots and fields this week showed an average infestation of 21.6 percent. This was a decrease from the previous week of 7.3 percent, which was mostly due to some of the overwintered weevils dying and increase in the numbers of squares on the plants.

J. C. Clark (June 25): In Washington County (Delta section) weevils have scattered farther from hibernation quarters than in the past 2 years. Boll weevils appeared on the Experiment Station farm 13 days earlier than in 1935, 18 days earlier than in 1936, and 17 days earlier than in 1937.

Louisiana. C. O. Eddy (June): Farmers are reporting that the boll weevil is unusually abundant, and early indications are of 30- to 60-percent infestation.

R. C. Gaines (June 11): During the past week 48,000 cotton plants were examined in Madison Parish, and an average of 90 weevils per acre was found. During the same week in 1937, 49 weevils per acre, in 1936, 13 weevils per acre, and in 1935, 140 weevils per acre were found.

(June 22): Punctured squares have been found in practically all fields where records have been made. Infestation ranged from 0 to 15 percent. Weevils appear to be widely scattered. First-generation, field-reared weevils are appearing. Weather conditions have been very favorable for the rapid multiplication of weevils.

Arkansas. D. Isely (June 22): The indications of a general infestation are much greater than they have been any year since 1932. Within the last 10 days reports of boll weevil occurrence have come from scattered localities over the greater part of the cotton-producing areas in the State with the exception of the northeastern counties.

Oklahoma. C. F. Stiles (June 22): Boll weevils have been reported damaging squares as fast as they set in southeastern Oklahoma.

F. A. Fenton (June 23): Heavy spotted infestations occur.

Texas. F. L. Thomas (June 3): Total weevil emergence has been 5.98 percent, which is higher than the average in central Texas. Over half of these overwintering weevils emerged during May. Little increase was noted in the infestation in Hidalgo County during the last week. In 4 fields examined an average of 13 percent, with a maximum of 25 percent punctured squares, was found. In 21 fields examined an average of over 500 weevils per acre has been found in upland fields of presquare cotton of Brazos County and river-bottom fields of Jackson County. Few weevils were found in river-bottom fields of Burleson County and open-prairie fields of Calhoun County. (June 10): A slight decrease was noted in the population in presquare cotton in the river bottoms of Jackson County and upland fields of Brazos County. An average of 1 weevil per 200 plants has been found in fields near favorable hibernation quarters in the river bottoms of Brazos and Burleson Counties, and a maximum of 24 percent punctured squares in the oldest fields. (June 17): A slight increase was noted in the infestation in Hidalgo County last week, an average of 14 percent of the squares being found punctured in the four fields examined. In the fields of southern and central Texas, where the numbers of overwintering weevils have been found to be high, the injury, or number of punctured squares, is noticeable.

R. W. Moreland (June 25): The infestation in untreated plots this week ranged from 12 to 30 percent averaging 21 percent, as compared with 14 percent last year. A few weevils are still emerging from hibernation cages.

K. P. Ewing (June 25): In Calhoun and Jackson Counties, on the Gulf coast, the potential damage appears to be greater than last year.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (June 4): The records indicate that the survival in hibernation cages at Presidio is 7.21 percent, which is lower than for the same period last year, when it was 10.36 percent. (June 25): The number of larvae collected in blooms increased from 69 per acre on June 15 to 142 on June 23. The fields which were heavily pastured last fall continue to show the lowest infestation.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Texas. F. L. Thomas (June 10): Leaf worms have been found in Hidalgo County and in all fields examined in Calhoun County. (June 17): Fullgrown leaf worms, some of which are beginning to "web up," have been observed in a number of fields in Calhoun County.

K. P. Ewing (June 11): Many fields in Calhoun County show ~~leaf~~ ragging although no real damage has been noted. (June 25): A new crop of leaf worms is beginning to appear in Calhoun County. Several farmers have used control measures, although there is no widespread poisoning.

R. W. Moreland (June 25): The first leaf worm was collected in the vicinity of College Station on June 18.

BEEF ARMYWORM (Laphygma exigua Hbn.)

Arizona. T. P. Cassidy (June 11): Approximately 650 acres of cotton in the Marana section became heavily infested. (June 25): The infestation has practically disappeared as a result of the irrigation.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Georgia. P. M. Gilmer (June 19): At Tifton, in southern Georgia, there are only a few flea hoppers present.

Wm. L. Lowry (June 19): In Lowndes and Echols Counties very few flea hoppers have been observed on Sea Island cotton.

Mississippi. D. W. Grimes (June 24): Some injury noted in fields in central Mississippi.

R. L. McGarr (June 25): Inspection of 8,000 terminal buds in 24 untreated plots and fields of cotton this week at State College showed a very light infestation, averaging 5.7 flea hoppers per 100 buds. There has not been any noticeable increase in flea hoppers for some time.

Louisiana. C. O. Eddy (June): Cotton flea hoppers are reported from the northwestern corner of the State down the Red River Valley as far as Alexandria and Marksville on cotton and bitterweed.

R. C. Gaines (June 25): Flea hoppers are very scarce on cotton at Tallulah and less abundant than during the past 2 years.

Texas. F. L. Thomas (June 3): Total emergence has been lower than average in central Texas. Hoppers increased in some fields of Burleson and Calhoun Counties during the last week. (June 10): The population increased during the last week in southern and central Texas, increasing in southern Texas from an average of 6 to 27 flea hoppers per 100 terminal buds. A large increase was noted in the adult population in a number of fields in Burleson and Milam Counties. Typical injury has been noted

in some of the oldest cotton fields. (June 17): Flea hoppers have increased considerably during the last week in Calhoun County. The average infestation in 38 fields is 75 hoppers per 100 terminal buds, which is almost a 300-percent increase over last week. In central Texas flea hoppers increased slightly in some fields, while in others, over a 200-percent increase was noted. Injury is noticeable in some fields. (June 24): The weather during the past week in southern and central Texas has been favorable for the multiplication of flea hoppers, which are doing considerable injury in southern Texas. Field inspections and flight trap records show that there has been a distinct migration of adults from native host plants to cotton during the last week. Few flea hoppers have been found on cotton in either Milam or Kaufman Counties.

R. W. Moreland (June 25): The flea hopper population is light in most upland fields.

K. P. Ewing (June 25): At Port Lavaca, in Calhoun County, the cotton flea hopper continues to do very severe and serious damage. An average of 78.5 flea hoppers per 100 terminal buds was found on 7,100 terminal buds inspected. This is in comparison to 77.4 last week.

THRIPS (Thysanoptera)

Mississippi. C. Lyle (June 6): Some late cotton in Washington County showed injury. (June 24): An infestation on young cotton plants recently reported from Scott, Bolivar County.

Louisiana. C. O. Eddy (June): Cotton thrips (Frankliniella tritici Fitch) have been abundant again during June on cotton that was planted late. This is the most abundant species.

Texas. F. L. Thomas (June 24): Thrips are reported to be doing injury to the young cotton in Dickens and Lubbock Counties, in northwestern Texas.

California. C. S. Morley (June 4): In some places in Kern County bean thrips, Heliothrips fasciatus Perg., are showing up on wild lettuce around cotton plantings in some places and the thrips are attacking the young cotton.

FOREST AND SHADE-TREE INSECTS

CANKERWORMS (Geometridae)

Vermont. H. L. Bailey (June 22): Fall cankerworms (Alsophila pometaria Harr.) are abundant in Ferrisburg, Addison County, western Vermont, on soft maple, basswood, and other foliage. The larvae were nearly full grown on June 9. Spring cankerworms (Palcaacrita vernata Peck) are abundant on elms at occasional points from Burlington, Chittenden County, western Vermont, south through Addison County. Some elms were nearly defoliated on June 21, but no larvae were present at that time and the pupae were found at the tree bases.

Connecticut. W. E. Britton (June 24): Spotted infestations of A. pometaria on deciduous trees in Cheshire, Cornwall, Lime Rock, and Sharon were reported. A group of nine trees in Cheshire and many woodland trees in Lime Rock were completely stripped.

Wisconsin. E. L. Chambers (June 28): Complete defoliation of many farm orchards and shade trees by cankerworms has occurred in southern Wisconsin during the last 2 weeks, where control measures have not been taken.

C. L. Fluke (June 21): P. vernata is present on elm and apple in southeastern Wisconsin and very numerous in unsprayed orchards.

Minnesota. A. G. Ruggles (June): Many reports of cankerworms came in from around Saint Paul and Minneapolis and also from Thief River Falls, Pennington County, in northwestern Minnesota.

North Dakota. J. A. Munro (June 21): Severe defoliation of trees by cankerworms is reported from Minot, Ward County, in the north-central part of the State.

SPANWORMS (Geometridae)

Connecticut. R. B. Friend (June 14): Ennomos subsignarius Hbn. reported attacking red maple, ash, elm, American hornbeam, and yellow birch at Monroe, in the southwestern part of the State. About 250 acres of woodland were defoliated in an area restricted to low land. The larvae are beginning to pupate.

Pennsylvania. R. M. Baker (June 23): The small white geometrid, Physosotegania pustularia Guen., is beginning to fly in numbers in wooded areas.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Vermont. K. W. Edwards (June 10): Defoliation of maple and birch reported in woodland on Riker Mountain Range near Waterbury, in the north-

central part of the State.

K. W. Edwards and B. B. Mitchell (June 10 and 22): Defoliation of several acres of maple and birch around Duxbury and Stowe, northwestern Vermont, is reported. One hundred acres of woodland, maple and poplar, is 75 percent defoliated near Jericho, in the same general area.

E. L. Keniston (June 18): Heavy defoliation of maple, elm, and oak, mostly in maple orchards, is reported from Manchester and Dorset, southwestern Vermont.

H. N. Bean (June 23): Heavy defoliation of maple reported from southeastern Vermont at Chester, Cavendish, Springfield, and Baltimore.

Massachusetts. A. L. Bourne (June 24): The tent caterpillars have stopped feeding and throughout the State have shown a marked decline from their abundance a year ago. This is the first time for several seasons that there has been any appreciable decline in their numbers.

Connecticut. R. B. Friend (June 17): Sugar maples for a distance of about 2.5 miles along the highway near Litchfield and extending some distance back into the woodland are defoliated, many of them completely. The larvae are about full grown. P. Wallace reports that there are approximately 300 acres in Goshen and 100 acres in the northern part of Cornwall wherein the maple trees are from 50 to 95 percent defoliated. These three areas are not contiguous but are all in Litchfield County, northwestern Connecticut.

Pennsylvania. R. L. Hardy (June 4): A large area of maple, ash, and cherry is 75 percent defoliated in Oregon Township, southeastern Pennsylvania.

Michigan. R. Hutson (June 22): Reported from Harrisville and Spruce in the northern part of the Lower Peninsula.

North Dakota. J. A. Munro (June 21): Abundant and causing defoliation of shelterbelts in the vicinity of Casselton, in Cass County, southeastern North Dakota.

Washington. M. H. Hatch (May 28): Willow trees south of Renton in the west-central part of the State are being stripped by this insect.

W. W. Baker (June): Malacosoma sp. is reported as extremely abundant on fruit trees and shrubs during June, particularly in the northern part of Vashon Island, just south of Seattle.

FALL WEBWORMS (Hyphantria spp.)

Connecticut. E. P. Felt (June 21): The fall webworm (H. textor Harr.) is becoming abundant in the Stanford area, in the southwestern part of the State.

Pennsylvania. E. P. Felt (June 21): H. textor has appeared at Villanova in southeastern Pennsylvania.

H. E. Hodgkiss (June 23): H. cunea Drury is **very** abundant on shade trees in the central counties.

Tennessee. G. M. Bentley (June 18): H. cunea is reported on elm and oak trees at Memphis, Shelby County, in **southeastern** Tennessee.

BAGWORM (*Thyridopteryx ephemeraeformis* Haw.)

Pennsylvania. H. E. Hodgkiss (June 14): Small bags are being formed on arborvitae in the southeastern area.

Tennessee. G. M. Bentley (June 18): Reported as doing severe injury to evergreens in central and western Tennessee.

Mississippi. C. Lytle (June 24): There seems to be a rather heavy general infestation on arborvitae over the State.

Texas. C. B. Nickels (June 1): Exceptionally abundant on evergreen trees at Brownwood, in north-central Texas.

ORIENTAL MOTH (*Cnidocampa flavescens* Walk.)

~~Massachusetts. E. P. Felt (June 21): A pupa was received from Pittsfield, Berkshire County, in western Massachusetts.~~

GREEN FRUITWORM (*Graptolitha antennata* Walk.)

Vermont. H. L. Bailey (June 22): Larvae were abundant on silver maple, brown ash, and willow close to Lake Champlain at Ferrisburg, in the northwestern part of the State, on June 9. Much variation in size was noted.

ASH

CARPENTER WORM (*Prionoxystus robiniae* Peck)

North Dakota. J. A. Munro (June 21): Reported doing serious injury to ash trees at Tyler, Richland County, and at Jud, LaMoure County, both in the southeastern part of the State.

Nebraska. M. H. Swenk. Found attacking ash and elm trees in Garden County, west-central Nebraska, on May 27, and in Holt County, northern Nebraska, on May 30.

WOOLLY BEECH APHID (*Phyllaphis fagi* L.)

New York. R. E. Horsey (June 2): Reported as quite severe on several varieties of the European beech at Rochester.

Maryland. E. N. Cory (June 7): Noted on purple beech at Hagerstown, in the northwestern part of the State.

BIRCH

BRONZED BIRCH BORER (Agrilus anxius Gory)

Connecticut. E. P. Felt (June 21): This pest was found abundant in white birch at Fairfield.

Indiana. J. J. Davis (June 13): Reported destroying birch at Indianapolis on May 22.

Iowa. C. J. Drake (June 25): Infestations have been reported from Davenport, in Scott County, east-central part of the State, and from Colfax, in Jasper County, central part of the State.

North Dakota. J. A. Munro (June 17): One adult beetle reared from a pupa taken from small wild cottonwood at Valley City, Barnes County, southeastern North Dakota, on May 4. (Mr. Munro had previously reported that a considerable number of these wild seedlings--being dug along the rivers for use in shelterbelt plantings--were infested with this beetle.) (Det. by W. S. Fisher.)

Nebraska. M. H. Swenk (June 22): In Douglas County, in the east-central part of the State, this insect was reported on birch.

CATALPA

CATALPA SPHINX (Ceratomia catalpae Bdv.)

Ohio. E. W. Mendenhall (June 25): Quite injurious on Catalpa bungei trees in Columbus.

ELM

ELM LEAF BEETLE (Galerucella xanthomelacna Schr.)

Vermont. H. L. Bailey (June 22): Very abundant on elm at Winooski, Chittenden County, in northwestern Vermont. Foliage on many trees badly eaten by the adults on June 2, and many beetles and eggs on foliage. No larvae present. Eggs but no larvae on foliage in Burlington on June 14.

Kentucky. M. L. Didlake (June 14 and 21): Very destructive in Jessamine County, in the east-central part of the State, on June 14 and at Lexington and Shelbyville on June 21.

California. C. S. Morley (June 4): Has completed its life cycle on elm and many trees are severely injured in Kern County.

RED ELM BARK WEEVIL (Magdalis armicollis Say)

Nebraska. M. H. Swenk (June 22): Reported damaging elm trees in Holt County on June 7 and Chinese elm trees in Perkins County on June 9.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Indiana. J. J. Davis (June 13): Was hatching on June 9.

Illinois. W. P. Flint (June 23): This pest has spread very rapidly during the last two or three seasons. Most of the central and northern Illinois cities and towns show some infestation. It is very general throughout many cities. Damage has been light for the last two seasons but is on the increase this year.

Wisconsin. C. L. Fluke (June 21): Reported from the southern part of the State from the following locations: Crawford, Jefferson, Calumet, and Milwaukee Counties.

Iowa. C. J. Drake (June 25): Has been reported on elms from the eastern half of the State from the following locations: Cedar Falls (Black Hawk County), Ankeny and Des Moines (Polk County), Cedar Rapids (Linn County), Ames (Story County), and Clarion (Wright County).

Utah. G. F. Knowlton (June 20): Damage has recently been reported from Salt Lake City and Logan.

WOOLLY ELM APHID (Eriosoma americanum Riley)

Michigan. R. Hutson (June 22): This pest was found on June 17 at Hulbert, in the Upper Peninsula.

South Dakota. H. C. Severin (June): Exceptionally abundant and has done considerable damage to elm.

Nebraska. M. H. Swenk (June 22): Elm trees in Lancaster, Cedar, Nance, Holt, Garfield, Custer, Sheridan, and other counties are being attacked

DOUGLAS FIR

AN APHID (Chermes cooleyi Gill.)

New York. R. E. Horsey (June 7): A severe infestation on a number of Douglas fir in two widely separated ornamental plantings in Rochester. In addition to the typical trees, a compact form of Douglas fir was very badly disfigured, and the injury to the leaves very noticeable.

LARCH

LARCH CASE BEARER (Colcophora laricella Hbn.)

Massachusetts and Connecticut. A. F. Burgess (June 2): Field reports

indicate that this insect is very abundant in the southern section of Berkshire County, Mass., and in sections of Litchfield County, Conn. In these areas much damage has been noted this season. During recent years many larch trees have been killed.

New York. R. E. Horsey (June 3): A few were feeding on larch as late as June 3 at Rochester.

WOOLLY LARCH APHID (Chermes strobilobius Kltb.)

New York. R. E. Horsey (June 6): Numerous at Rochester on several European and Japanese larches.

LOCUST

LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

Tennessee. G. M. Bentley (June 14): Completely defoliating black locust trees in the vicinity of Brunswick, in Shelby County.

Mississippi. C. Lyle (June 24): Adults sent in by F. A. Smith on May 30 with a report that they were abundant on black locust trees in Marshall and Lafayette Counties. Reported on June 21 that they were also abundant on black locust in Coahoma County. (All counties mentioned are in the northern part of the State.)

A CECIDOMYID (Cecidomyia robiniae Hald.)

Mississippi. C. Lyle (June 24): Black locust leaves showing a moderate infestation were sent in on June 21 from Clarksdale, Coahoma County.

MAPLE

GOUTY VEIN GALL (Dasynura communis Felt)

Connecticut. W. E. Britton (June 22): Seemingly more abundant than usual on sugar maple. During the last month seven lots of specimens have been received for identification from Collinsville, Manchester, New Milford, Plainville, Simsbury, Torrington, and West Hartford.

NORWAY MAPLE APHID (Periphyllus lyropictus Koss.)

Pennsylvania. H. E. Hodgkiss (June 25): Very abundant on street and lawn trees and causing extreme annoyance on account of the honeydew.

Virginia. A. M. Woodside (June 24): The threatened outbreak at Staunton has been checked completely by predators.

WOOLLY ALDER APHID (Prociphilus tessellatus Fitch)

Maryland. E. N. Cory (June 22): Very abundant in a general infestation on maple.

AN APHID (Neoprociphilus aceris Monell)

Connecticut. W. E. Britton (June 22): Sugar maple leaves heavily infested and partly brown received from Bridgeport and New Haven.

COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Ohio. T. H. Parks (June 13): This scale is quite abundant on soft maple in Champaign and Franklin Counties, in the northern half of the State.

Illinois. W. P. Flint (June 23): This scale has been sent in from many localities in northern and north-central Illinois. One specimen has come from the southern part of the State. Most infestations are very heavy.

Michigan. E. I. McDaniel (June 17): The insects have laid practically all their eggs and some of these are just beginning to hatch. It has been reported as attacking maple at Port Huron, Grand Rapids, and Jackson, in the southern part of the State.

WALNUT SCALE (Aspidiotus juglans-regiae Comst.)

Ohio. J. S. Houser (June 10): Branches heavily encrusted with insects about two-thirds grown received from Norwood in southwestern Ohio. This insect has not been common in the State within recent years.

TERRAPIN SCALE (Lecanium nigrofasciatum Perg.)

Ohio. J. S. Houser (June 10): This scale is unusually prevalent on maple in many sections of Ohio and the degree of infestation is extreme. In northern Ohio the young are beginning to appear.

MAPLE BLADDER GALL (Phyllocoptes quadripes Shim.)

Connecticut. W. E. Britton (June 22): Apparently more prevalent on silver maple than usual. Specimens received from Branford, Clinton, Fairfield, New Canaan, New London, North Woodbury, and Waterbury.

Michigan. E. I. McDaniel (June 17): First samples of this gall on maple were received from Eaton Rapids, in southern Michigan.

OAK

AN APHID (Myzocallis californicus Baker)

California. E. O. Essig (May - June): This aphid was especially abundant on Quercus kelloggii in the Yosemite Valley during the latter part of May and the early part of June. The ladybird beetle (Hippodamia convergens Guen.) began its emergence and migrations early in June and apparently checked the aphid very materially by the middle of the month. This is the first record of an abundance of the oak aphid

in the Yosemite Valley, although it has been observed there by the writer since 1928.

A SCALE (Kermes pubescens Bogue)

Illinois. W. P. Flint (June 23): The oak kermes has been abundant at several points in Illinois, attacking woodland trees, as well as those in cities and towns.

Iowa. C. J. Drake (June 21): Receiving considerable number of specimens of this oak scale this spring. (Det. by H. Morrison.)

Nebraska. M. H. Swenk (June 22): A Douglas County correspondent reported on June 12 that an oak tree in his yard was being denuded of leaves.

PINE

BLACK TURPENTINE BEETLE (Dendroctonus terebrans Oliv.)

Mississippi. C. Lyle (June 24): Specimens received from Pontotoc, in northern Mississippi, on June 23 with a report that they were abundant in dying pine trees over a small area.

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

Pennsylvania. H. E. Hodgkiss (May 27): Heavy infestations occur in the Philadelphia area.

Delaware. E. P. Felt (June 21): Was found injuring red pine at Wilmington.

Michigan. R. Hutson (June 22): Found in jack pine at Roseville, Macomb County, in the southeastern corner of the State.

A SHOOT MOTH (Rhyacionia rigidana Fern.)

Tennessee. G. M. Bentley (June 18): Specimens of new growth of Japanese table pine, with twig borer injury, collected at Kingsport on June 7. (Det. by C. Heinrich.)

SPRUCE BUDWORM (Cacoecia fumiferana Clem.)

Michigan. E. I. McDaniel (June 7): The spruce shoot moth was beginning to pupate on June 2. An ornamental stand of Scotch pine near East Lansing was heavily infested.

SAWFLIES (Neodiprion spp.)

New Hampshire and Massachusetts. J. V. Schaffner, Jr. (June 18): A sawfly appears to be increasing in numbers and is a serious menace to red pine in eastern Massachusetts and southern New Hampshire. In many State and municipal reservations, such as State parks, State

forests, and watersheds, and on private property many red pine plantations were sprayed to prevent serious defoliation. Heavy feeding occurred in some plantations in Essex, Middlesex, and Worcester Counties, Mass. In Massachusetts the eggs hatched during the latter part of April this year and most of the larvae completed their feeding by the second week in June.

Indiana. G. E. Gould (June 23): The pine sawfly (N. pinctum Nort.) defoliated 12 large white pines at Monticello, in White County.

Nebraska. M. H. Swenk (June 21): The fir sawfly (N. abietis Harr.) was found defoliating pine trees in a grove in Antelope County on May 2

A SAWFLY (Neodiprion sortifer Geoff.)

New Jersey. J. V. Schaffner, Jr. (June 18): Infestations of this species in New Jersey appear to be increasing in intensity, severe defoliation having occurred this spring in both large and small plantations of red pine, and in small groups of Japanese, red, Scotch, jack, and Swiss mountain pines in Somerset. White pine and Austrian pine are fed upon rather sparingly even when growing in close proximity to heavily infested trees of other species. Hatching this year took place late in April, and feeding was completed in May before this season's growth had developed to the point where the needles separate. In severely defoliated plantations new cocoons were found on the twigs, particularly beneath the male flower catkins, as well as in the duff under the trees. Infestations are now known to occur in the northern half of the State in Hunterdon, Mercer, Middlesex, Morris, Somerset, and Union Counties.

INTRODUCED PINE SAWFLY (Diprion similis Htg.)

Michigan. E. I. McDaniel (June 28): On June 25 a large number were collected on Scotch pine in a nursery near Monroe. At present the larvae have completed their development and many of them are ready to spin up.

SPITTLEBUGS (Aphrophora spp.)

New England. J. V. Schaffner, Jr. (June 18): The spittle bug is common to abundant in many plantations of red, Scotch, and white pine from the central part of New Jersey to southern New Hampshire.

Connecticut. M. P. Zappe (June 23): A. parallela Say is very abundant in certain plantations of red and white pine.

A PITCH MIDGE (Retinodiplosis resinicola O. S.)

Michigan. E. I. McDaniel (June 10): A large quantity of jack pine twigs and branches infested with this insect have been received. Material comes from Fife Lake, and the infestation is understood to be

widespread but only trees along the edge of the plantation or trees standing in the open are infested.

PINE BARK APHID (Pineus strobi Htg.)

Connecticut. E. P. Felt (June 21): Somewhat abundant at Lakeville, in the western part of the State.

South Carolina. J. A. Berly (June 22): A light infestation reported on white pine at Greenville.

A MITE (Eriophyes pini Nal.)

California. E. O. Essig (June 27): Doing serious damage to old Monterey pine trees and even killing young trees in the San Francisco Bay district.

POPLAR

GOLDSMITH BEETLE (Cotalpa lanigera L.)

Nebraska. M. H. Swenk (June 22): Specimens from a cottonwood tree sent from Antelope County on June 18. Additional specimens were sent in from Cuming County on June 20. Both localities are in northeastern Nebraska.

POPLAR LEAF BEETLE (Phytodecta pallida L.)

Pennsylvania. H. E. Hodgkiss (June 16): Very abundant in the western part of the State.

NEVADA BUCK-MOTH (Hemileuca nevadensis Stretch)

Nebraska. M. H. Swenk (June 22): Caterpillars feeding on cottonwood were sent in from Sheridan County, in the northwestern part of the State, on May 21.

SPRUCE

A LEAF MINER (Recurvaria sp.)

Rhode Island. A. E. Stene (June 9): A leaf miner, probably R. piceaella Kearf., has been found for the first time in the State on Colorado blue spruce.

SPRUCE GALL APHID (Chermes abietis L.)

New York. R. E. Horsey (June 14): Galls conspicuous on a couple of small white spruces in an ornamental planting at Rochester.

Michigan. R. Hutson (June 22): Found on Norway spruce at Ludington, on the Lower Peninsula.

SPRUCE MITE (Paratetranychus uniunguis Jacobi)

Connecticut. W. E. Britton (June 22): Found in its usual abundance in the State. Specimens received from Derby, Manchester, and Meriden, some of them showing twigs severely damaged.

WILLOW

MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

Michigan. R. Hutson (June 22): Larvae are very common about Saginaw, Flint, and Lansing, in southern Michigan.

Iowa. H. E. Jaques (June 23): Caterpillars are again defoliating willows and Chinese elms.

Nebraska. M. H. Swenk (June 22): Larvae found defoliating branches of American elm at Lincoln on May 30. Other specimens were sent in from Washington County on June 8 and from Hamilton County on June 11.

A LEAF BEETLE (Chrysomela lapponica L.)

Ohio. T. H. Parks (June 20): These beetles and their larvae have been attacking and defoliating many willow trees in ornamental plantings throughout the State. Complaints are general and have been received since May 8.

Indiana. J. J. Davis (June 13): Larvae were defoliating ornamental willows at Decatur and Waterloo, in northern Indiana, the last of May and the first of June.

COTTONWOOD LEAF BEETLE (Chrysomela scripta F.)

Texas. F. W. Mally (June 17): Seriously injured willows in ornamental plantings in San Antonio.

Idaho. J. R. Douglass and W. E. Peay (June 28): The beetles have nearly defoliated the young twigs of several cottonwood trees at Buhl, in south-central Idaho.

POPLAR AND WILLOW BORER (Cryptorhynchus lapathi L.)

Michigan. R. Hutson (June 22): Found to be doing serious damage on ornamental plantings at Detroit.

ELM SAWFLY (Cimbex americana Leach)

Wisconsin. C. L. Fluke (June 21): Adults are very numerous in western Wisconsin in Eau Claire, Clark, Chippewa, and Monroe Counties and in the southeastern part of the State at Green Lake.

Iowa. H. E. Jaques (June 23): Adults are out in extraordinary abundance in Dickinson County, northwestern Iowa.

Kansas. H. R. Bryson (June 1): The larvae are quite common this year. The pest is reported as quite abundant at Coffeyville and some individuals have been taken at Manhattan, Humboldt, and Winfield.

INSECTS AFFECTING GREENHOUSE
AND ORNAMENTAL PLANTS

FOUR-LINED PLANT BUG (Poecilocus lineatus F.)

Ohio. T. H. Parks (June 15): These plant bugs have been attacking chrysanthemum leaves at Columbus and have been sent in from several localities as working on chrysanthemums and fall anemones.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

Vermont. H. L. Bailey (June 22): Eggs began hatching at Montpelier, in central Vermont, between May 31 and June 3.

Michigan. E. I. McDaniel (June 17): Eggs are hatching and the young are establishing themselves on twigs and branches of maple and lilac at East Lansing.

Kentucky. M. L. Didlake (May 30): Abundant on apples at Hallie, in southeastern Kentucky.

AZALEA

AZALEA LEAF MINER (Gracilaria azaleella Brants)

Maryland. E. N. Cory (June 22): Found on outdoor azaleas in Baltimore.

BOXWOOD

BOXWOOD PSYLLID (Psyllia buxi L.)

Maryland. E. N. Cory (June 22): Found on boxwood in Charles County, southern Maryland.

CHRYSANTHEMUM

CHRYSANTHEMUM GALL MIDGE (Diarthronomyia hypogaea Loew)

Kentucky. M. L. Didlake (May 26): Reported as injurious at Independence, Kenton County, in north-central Kentucky.

FIRETHORN

WESTERN TUSSOCK MOTH (Hemerocampa vetusta Bdv.)

California. E. O. Essig (June): Very abundant in parts of Berkeley in June and has completely defoliated portions of hedges of Chinese hawthorn (Pyracantha crenulata).

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

North Carolina. C. S. Brinley (July 2): Worst case on gladiolus for years in my garden at Raleigh, and many other reports of thrips on gladiolus.

GOLDENROD

A DIPTEROUS GALL (Eurosta solidaginis Fitch)

Michigan. R. Hutson (June 22): Reported from Ionia, in southern Michigan.

HOLLYHOCK

A LEAF BEETLE (Calligrapha signoidea Lec.)

Washington. E. J. Newcomer (June 18): Reported as being common on garden hollyhocks at Yakima and Pullman.

IRIS

A WEEVIL (Mononychus vulpeculus F.)

Connecticut. W. E. Britton (June 22): Adults damage iris plants by eating into the buds. Specimens received from Roxbury, Thompsonville, and Woodbridge, in western Connecticut.

Michigan. E. I. McDaniel (June 7): Specimens received from Lakeview on June 6; also on wild iris from the vicinity of East Lansing, both in south-central Michigan.

JUNIPER AND CEDAR

JUNIPER SCALE (Diaspis carueli Targ.-Tozz.)

Pennsylvania. H. E. Hodgkiss (June 15): Young are hatching; at least 50 percent hatched in the southeastern part of the State.

South Carolina. J. A. Berly (June 22): Reported in a moderate infestation on juniper at Greenville, in the northwestern part of the State.

LILAC

LILAC BORER (Podosesia syringae Harr.)

New York. R. E. Horsey (June 15): A number found in lilac at Rochester on June 15. This is a troublesome pest here.

Iowa. C. J. Drake (June 25): Reported in privet hedge and lilac in Hampton, Franklin County; Ames, Story County; and Des Moines, Polk County; all in central Iowa.

RHODODENDRON

A BOSTRICHID (Polycan confertus Lec.)

California. E. O. Essig (June 27): Boring into the terminal buds and preventing new growth and flowers for the coming season at Berkeley.

RHODODENDRON LACE BUG (Stephanitis rhododendri Horv.)

Pennsylvania. H. E. Hodgkiss (June 25): Large numbers of adults and immature individuals present in the Philadelphia area.

AZALEA SCALE (Eriococcus azaleae Comst.)

Ohio. J. S. Houser (June 9): Infestation on rhododendron at Youngstown, in northeastern Ohio, of sufficient intensity to require treatment. Eggs have been deposited in abundance by some females. A few eggs have hatched.

ROSE

ROSE CURCULIO (Rhynchites bicolor F.)

Pennsylvania. H. E. Hodgkiss (June 8): Adults very abundant in rose gardens.

South Dakota. H. C. Severin (June): Especially abundant over the State and has done considerable damage to roses.

Nebraska. M. H. Swenk (June 22): An inquiry as to the control of the rose curculio from Holt County, in northern Nebraska, on May 23.

A HYMENOPTEROUS GALL (Rhodites nebulosus Bass.)

Nebraska. M. H. Swenk (June 22): Specimens of galls on rose leaves received from Gage County, in southeastern Nebraska, on May 24.

ROSE LEAF BEETLE (Nodonota puncticollis Say)

Pennsylvania. H. E. Hodgkiss (June 8): Very abundant on apple and cherry trees and on rose bushes.

Delaware. E. P. Felt (June 21): Reported as abundant on roses near Wilmington.

A LEAF BEETLE (Antipus laticlavus Forst.)

Florida. J. R. Watson (June 24): Sent in from Lake Wales, central Florida, where it was said to be quite injurious to roses.

A LEAFHOPPER (Oncometopia undata F.)

Florida. J. R. Watson (June 24): Doing considerable injury to roses in Alachua County, north-central Florida.

ROSE SAWFLY (Caliroa aethiops F.)

Nebraska. M. H. Swenk (June 22): Specimens of rose leaves, showing attack by the European rose slug, received from Nance County, in east-central Nebraska, on June 17.

GRASS THRIPS (Anaphothrips obscurus Mull.)

Pennsylvania. H. E. Hodgkiss (June 9): Grass thrips is seriously damaging roses.

SUNFLOWER

Missouri. A. F. Satterthwait (June 24): An experimental plot of sunflowers planted near East Prairie, in extreme southeastern Missouri, showed about 100 percent of plants infested on May 9 and probably over 25 percent with terminal buds destroyed by larvae of a moth, Eucosoma helianthana Riley. Ligyris gibbosus Deg. **destroyed and is infesting** about 4 percent of the plants, the adults attacking the roots. A beetle, Cylindrocopterus adpersus Lec., was numerous in the plot, as were adults of Rhodoaenus tredecimpunctatus Ill. About 1 percent of the plants in the plot were broken off by Oecanthus nigricornis quadripunctatus Bout.

YEW

BLACK VINE WEEVIL (Brachyrhinus sulcatus F.)

New Hampshire. E. P. Felt (June 21): The insect was found injuring Taxus at Dublin, in southwestern New Hampshire.

Massachusetts. E. P. Felt (June 21): Was found on Taxus at Lincoln, in the eastern part of the State.

New York. E. P. Felt (June 21): Was found injuring Taxus at White Plains, in Westchester County.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MAN

MOSQUITOES (Culicinae)

New Jersey, Delaware, and Maryland. G. H. Bradley (June 20): A period of high tides and heavy rains during the last few days of May in the coastal areas of these States caused considerable breeding of mosquitoes in the salt marshes. Adult mosquitoes, Aedes cantator (Coq.) and principally A. sollicitans (Walk.), emerged during the first week in June and invaded the coastal towns in numbers sufficient to cause annoyance.

Iowa. C. J. Drake (June 25): Very abundant and many complaints being received from all parts of the State. Heavy rains have provided an abundance of breeding places.

North Dakota. J. A. Munro (June 21): Abundant over a wide area.

Kansas. H. R. Bryson (June 25): More abundant than last year.

Utah. G. F. Knowlton (June 16): A. dorsalis Meig. is extremely abundant and annoying in the meadows west and northwest of Ephraim and at Farr West, in central Utah.

CHIGGER (Trombicula irritans Riley)

South Carolina. O. L. Cartwright (June): Causing complaints in many parts of the State.

Kentucky. M. L. Didlake (June 20): Reported as abundant in the Pewee Valley, in north-central Kentucky, on June 20.

Kansas. H. R. Bryson (June 25): Considerably more abundant than last year.

TROPICAL FOWL MITE (Liponyssus bursa Berlese)

California. D. B. Mackie (June 21): Found in Sacramento on June 17, apparently spreading from a sparrow's nest in a vine into a house and causing considerable annoyance to the owners. This is the first record for California.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

Georgia. A. L. Brody (June 18): A case reported from $1\frac{1}{2}$ miles west of

Quitman on June 12, of an infestation in a horse. Specimens received from Quitman, Valdosta, and Lake Park, all in south-central Georgia. In the vicinity of Valdosta two specimens were found in the trap collection for the week ended June 13. (June 25): Two egg masses were deposited on artificially wounded animals at the experimental farm during the last week. A navel infestation in a calf reported from Quitman on June 19, in addition to a case in a hog during the week of June 13. One specimen was found in the status-trap catch at Quitman for the week ended June 22.

Florida. A. L. Brody (June 18): Reported from Arcadia, De Soto County, on June 11, from a herd of approximately 3,500 animals, that 395 cases had been treated since March 1, mainly in baby calves, and that screwworms are still abundant. On June 15 received larvae from Jasper, Hamilton County, removed from an infestation in a calf. Reported from Penney Farms, Clay County, that on June 2 all calves had worms. A few navel cases reported from 6 miles south of Madison, and a case in the shoulder of a dog reported on about May 1. Specimens received from Madison, Highland, and Hendry Counties, Jasper, and Penney Farms. (June 22): A specimen found in the status-trap collection at Lee, Madison County, for the week ended June 22.

Tennessee. G. M. Bentley (May 25): One infestation found near Arlington and another near Millington, in Shelby County. (June 18): An infestation found at Covington, Tipton County, near Charleston.

HORN FLY (Hæmatobia irritans L.)

Georgia. A. L. Brody (June 18): The average infestation per animal at Valdosta is still from about 100 to 200.

Florida. A. L. Brody (June 18): The average number of horn flies in a herd of about 600 animals at LaBelle, Hendry County, in southern Florida, was from about 500 to 1,000 on June 6. Considerable injury was evident on many of these animals. At Brooksville, Hernando County, in west-central Florida, a bull was covered with about 5,000 horn flies but the other animals in the herd were not so heavily infested.

Missouri. L. Haseman (June 24): Horn flies have been on the increase throughout the month.

Texas. E. W. Laake (June 20): A 25-percent decrease in population has been noted during the last month at Cresson, southwest of Dallas. Previous estimated infestations of 4,000 flies per head have been reduced to approximately 3,000 flies per head. In the vicinity of Dallas the population has been reduced approximately 50 percent, showing an average infestation of 500 flies per head on 40 dairy cows.

STABLEFLY (Stomoxys calcitrans L.)

Missouri. L. Haseman (June 24): Stableflies have been on the increase throughout the month.

Nebraska. M. H. Swenk (June 22): Sufficiently annoying in Dodge County, in east-central Nebraska, to ~~elicit an inquiry as to control on~~ June 10.

Kansas. H. R. Bryson (June 27): Unusually abundant on cattle, both in pastures and around lots.

Texas. E. W. Laake (June 20): Not troublesome in the vicinity of Dallas until June 17, following a heavy rain. Present infestation on calves at laboratory, 25 per head; on cattle at 2 nearby dairies, 10 per head. Reported from Cresson as being so numerous as to make it uncomfortable to sit on the porch in the evening.

TICKS (Amblyomma spp.)

Georgia. A. L. Brody (June 18): The Gulf coast tick (A. maculatum Koch) has been increasing rapidly at Valdosta during the last week.

Florida. A. L. Brody (June 18): Specimens of the lone star tick (A. americanum L.) collected from cattle at Penney Farms on June 2.

Texas. E. W. Laake (June 20): One infestation of lone star tick reported since June 1.

SHORT-NOSED CATTLE LOUSE (Haematopinus eurysternus Nitz.)

Texas. O. G. Babcock (June): All stages of development on isolated cows, a rather heavy infestation, in northwestern Texas.

HORSE

HORSEFLIES (Tabanidae)

Missouri. L. Haseman (June 24): Since June 15 the common, medium-sized, brown horsefly has been abundant and quite annoying, particularly just about sundown. Greenhead tabanids began appearing at Columbia the last of May and the first of June, reached a peak of abundance about June 15, and are now definitely on the decline.

Texas. E. W. Laake (June 20): Horseflies frequently observed during June. Six Tabanus atratus F. and T. lineola F., or closely related species, were caught by hand on four head of cattle and around the insectary at the laboratory on June 17. Twenty-eight horseflies, probably T. lineola, were caught in 1 week in a cattle fly trap located 15 miles north of Dallas.

BOTFLIES (Gastrophilus spp.)

Iowa. C. J. Drake (June 25): A species of botfly was received from Northwood, Worth County, in north-central Iowa, and was reported as annoying to horses.

S. W. Simmons (June 18): The earliest eggs of G. nasalis (L.) were found on horses at Ames on June 13, which is later than usual. From 100 to 200 eggs are collected daily from 18 horses.

Missouri. L. Haseman (June 24): The throat bot was observed ovipositing for the first time this summer on June 24 at Columbia.

Nebraska. H. O. Schroeder (June 18): G. hacmorrhoidalis (L.) was active at Fort Robinson, Dawes County, in northwestern Nebraska, on June 4. Larvae of this species began to issue from the horses at Fort Robinson on about May 15, and were observed in greatest numbers on about May 21. G. nasalis was active on June 4. Eggs of G. intestinalis Dog were found on horses at Page, Holt County, on June 14, a week or two earlier than oviposition has been noted in central Iowa and central Illinois.

Texas. E. W. Laake (June 20): Horse bots, probably G. intestinalis, were active near Fort Worth during the week ended June 18.

DOG

AMERICAN DOG TICK (Dermacentor variabilis Say)

Georgia. A. L. Brody (June 18): This tick has been the cause of two cases of paralysis in Valdosta. Reports of tick paralysis have been numerous from other sections of the Southeast.

Florida. A. L. Brody (June 18): Four dogs were reported from Highland County as suffering from tick paralysis and it was stated that all recovered after the ticks were removed. Another dog recovering upon the removal of the ticks was reported from the Chinsegut Hill Sanctuary Experiment Station, Hernando County.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

LEAD CABLE BORER (Scobicia declivis Lec.)

California. E. O. Essig (June): Unusually abundant in parts of central and northern California this spring and has been damaging hardwood house finishings and wine tanks.

DRIED FRUIT BEETLE (Carpophilus hemipterus L.)

California. D. F. Barnes (May 31): Dried fruit beetle traps operated in the vicinity of Fresno from February 26 to May 19 indicated that the overwintering and spring population was less than half the 8-year average but about three times that of 1937.

COCKROACHES (Blattidae)

Washington. M. H. Hatch (May 28): Blatta orientalis L. taken in an apartment house at Kent, in west-central Washington. Not previously recorded from this State. Pariplaneta americana (L.) was taken in a restaurant at Seattle, also not previously recorded from the State.



THE MORE IMPORTANT RECORDS FOR JULY

By the end of July effective baiting for grasshoppers gave a very high degree of control throughout most of the infested area, especially where idle lands did not breed tremendous populations. In the southern and western counties of North Dakota, and in counties of South Dakota west of the Missouri River, as well as in the eastern part of Wyoming and in 15 eastern counties of Montana, enormous populations of Melanoplus mexicanus developed in idle lands in which effective baiting was not accomplished. General migrations of adults began about July 4 and were observed at different times until about the latter part of the month. The flights were in northwestern, western, and southwestern directions from the western portions of the Dakotas, eastern Montana, and eastern Wyoming.

The Mormon cricket infestation of south-central North Dakota is very much heavier than it was last year, with but little damage occurring, however. Contiguous to this infestation a light infestation extends almost across the State of South Dakota. A similar light infestation occurs in central and western Nebraska. Heavy migrations are occurring in the Judith Basin in Montana and some damage is being done in parts of Wyoming. Heavy infestations, representing migrations moving down from mountainous areas in which control was not conducted this year, are occurring at points in southern Idaho, with damage being reported in places to alfalfa seed production. In Nevada there are several areas of rather heavy infestation, while in Utah, eastern Washington, and northeastern Oregon are several scattered outbreaks. The infestation in Colorado has been reduced to insignificant numbers. The crickets, for the most part, are mature and egg laying is well under way although apparently it has not reached its peak over most of the infested area.

Several species of wireworms were reported as doing damage in limited areas in South Carolina, in the Great Plains States, and California.

Japanese beetle was much more abundant than during preceding years in southwestern New England, southeastern New York, in Delaware, northeastern Maryland, and the Eastern Shore of Maryland and Virginia.

The Asiatic garden beetle has been reported as increasing in abundance in the District of Columbia and nearby Maryland.

The white-fringed beetle has been discovered in the following localities heretofore not known to be infested: A rather general infestation in the vicinity of Monroeville, Monroe County, Ala.; Conecuh County, Ala.; Mobile, Ala.; Pass Christian, Harrison County, Miss.; Bolton, Hinds County, Miss.; Carriere, Pearl River County, Miss.; and with a general extension of the area known to be infested about Gulfport, Miss., and New Orleans, La.

The stalk borer was reported as doing considerable damage to tomatoes, sweet corn, and several flower-garden plants from New York to Maryland and westward to Missouri and Nebraska.

The beet webworm was locally abundant on sugar beets and garden plants in parts of the Great Plains and the Great Basin.

Armyworm outbreaks were reported from New England, Middle Atlantic, East Central, and Plains States.

Corn ear worm seems to be about normally abundant throughout the Eastern and Southern States.

Heavy infestations of sweet corn by European corn borer were reported from Connecticut, New York, New Jersey, Ohio, and Indiana.

No serious chinch bug infestations developed in the East Central States. This insect, however, did considerable damage in limited areas in Missouri, Iowa, and Texas.

Three additional counties, Box Butte, Kimball, and Banner, in western Nebraska, one county in northeastern Colorado, three counties in north-central Wyoming, and two counties in southeastern Wyoming not previously known to be infested by the alfalfa weevil were found infested this year. The insect was also found in southeastern Douglas County, Oreg.

Codling moth infestations in the Eastern States were generally normal to subnormal during July.

Fruit aphids, particularly the rosy apple aphid, were somewhat more abundant this month in the Middle Atlantic and New England States, westward to Minnesota, Missouri, and Kansas.

Oriental fruit moth is reported as moderately abundant in the New England, Middle Atlantic, and South Atlantic States, but seems to be on the increase in parts of Virginia, northern Georgia, and parts of Ohio and Kentucky.

Late peaches in central Georgia were heavily infested by second-breed plum curculio. Severe damage was also reported from Mississippi, parts of Ohio, and Michigan.

Rather heavy infestations of grape leafhopper were recorded from New York through the Lake States to the Great Plains and in Utah.

Colorado potato beetle has been found on the western edge of the Twin Falls area, an important potato-growing section in south-central Idaho, not previously infested. This insect is also more abundant than last year in the Ogden-Clinton area of Utah.

Potato psyllid was causing very serious damage to potatoes in the North Platte River valley in Nebraska.

The potato leafhopper is more abundant than it has been for several years in Ohio.

The harlequin bug was reported in damaging numbers in Delaware, Maryland, Kentucky, Tennessee, Missouri, and Oklahoma.

Blister beetles were very generally reported from most parts of the country, often doing serious damage to truck and flower gardens.

Heavy infestations of forest tent caterpillar are reported from Vermont, Massachusetts, and New York.

General infestations by bagworm are reported from Delaware southward to Georgia and in the lower Ohio Valley States; also from parts of Texas.

Elm leaf beetle was reported as quite generally prevalent in the New England and Middle Atlantic States, southward to Virginia and westward to Ohio.

Walnut caterpillar was unusually abundant in the Ohio and Mississippi Valleys.

A very heavy outbreak of chironomid midges occurred during the month in the artificial lakes and lagoons on the site of the New York World's Fair.

The Lone Star tick was collected for the first time in New Jersey this year.

THE MORE IMPORTANT ENTOMOLOGICAL FEATURES
IN CANADA, FOR JULY, 1938

Dry weather in Manitoba, in July, resulted in increased grasshopper activity which necessitated the use of poisoned bait generally throughout the southwestern part of the province. Maturing grasshoppers were causing some anxiety towards the end of the month, but damage had been comparatively light. In Saskatchewan, rains improved the grasshopper situation but severe damage to the wheat crop by these insects continued in the southeast and northwest areas, with scattered trouble elsewhere. In some districts the grasshoppers moved from unpoisoned summerfallow, causing much defoliation generally, and forcing considerable cutting of the crop for feed. By July 19 heavy flights were beginning in the southeast. Early in July, grasshoppers were causing minor crop losses in certain areas of Alberta. Grasshopper depredations in the interior of British Columbia were aggravated by dry weather conditions.

Light to moderate outbreaks of the armyworm occurred in several areas in Ontario, and locally in the Brandon district, Manitoba.

Say's stinkbug is abundant in southern Alberta in localized areas. The infestation is concentrated in the Taber-Barnwell district, and is more severe than at any time since observations were commenced in 1936. Some losses have occurred along the margins of grain fields.

There is a general infestation of wheat stem sawfly over large areas of Alberta and Saskatchewan. Throughout the greater part of the infested area there are good crop prospects which will facilitate oviposition. This year there is a tendency for the very severe infestations to occur along the field margins.

The Colorado potato beetle is reported to be unusually abundant throughout its range in the Dominion.

Cucurbits have been severely infested by the striped cucumber beetle in southwestern Ontario, and locally elsewhere in Ontario and in Manitoba. For the first time the species occurred in economic abundance in Saskatchewan.

The beet webworm developed in great numbers in the provinces of Manitoba, Saskatchewan, and Alberta, and in many districts caused moderate to severe losses in garden crops. The activities of the insects were in part beneficial, in that they fed upon noxious weeds.

The imported cabbage worm was reported unusually injurious to early cruciferous crops in southwestern Ontario, and very scarce in southern Alberta.

The codling moth infestation is about average in the Niagara district, Ontario. In the Okanagan Valley, British Columbia, unusually heavy infestations were expected following prolonged dry hot weather.

In the Niagara fruit district of Ontario, the oriental fruit moth is at a low level. In the more heavily infested peach orchards in southwestern Ontario, the parasite situation is very encouraging.

Thirty percent of the cherries growing on a farm near Brentwood (Vancouver Island), British Columbia, were infested by the cherry fruitfly. Prior to 1937, this species had not been observed in the district since 1906.

Another year of heavy infestation by the European spruce sawfly is expected in the Gaspé Peninsula, Quebec. Collections from southern Ontario have shown that the species is well established and abundant at Galt, Toronto, and Guelph. It has also been taken near Barrie, Angus, Peterboro, and Lindsay. No previous records are known from this region.

The spruce budworm appears to be very active throughout southern Ontario and in northwestern Ontario, east to Dryden. An infestation also appears to be building up in southern Ontario.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

Wisconsin. E. L. Chambers (July 23): Only about 75 percent hatched. Very little crop damage, mostly in the northwestern quarter of the State.

Ohio. T. H. Parks (July 25): Grasshoppers present in no more than usual numbers and no injury expected in any part of the State.

Indiana. J. J. Davis (July 26): Quite a few cases reported of grasshopper abundance in vegetable and flower gardens, but no conspicuous outbreaks in the State.

Illinois. W. P. Flint (July 23): Grasshoppers have decreased greatly during the last month, owing to frequent and heavy rains. Present indications are that very little damage will occur in Illinois.

Michigan. Michigan Extension News (June): Control operations are under way in a number of counties in the northern half of the Lower Peninsula.

Minnesota. A. G. Ruggles and assistants (July): Grasshoppers are moderately to very abundant generally throughout the State.

Iowa. C. J. Drake (July 20): The population is quite heavy in western and southwestern Iowa, but more than normal numbers of hoppers occur here and there throughout the State. Most of the damage up to the present has been done by the two-striped grasshopper (Melanoplus bivittatus Say), but the less migratory (M. mexicanus Sauss.) and the differential grasshopper (M. differentialis Thos.), also occur in destructive numbers. Timely rains have destroyed large numbers of newly hatched hoppers throughout most of the State. Unusually large numbers of hoppers supported by wild growth, thus being kept out of cultivated crops.

H. E. Jaques (July 24): The grasshopper situation is serious along much of the western border of Iowa.

Missouri. L. Haseman (July 23): Grasshoppers have continued to be abundant but scattered throughout the State during the month. The lesser migratory species is much less abundant than a year ago and in the vicinity of Columbia largely gone. Two-striped hoppers have been attracting greater attention up to the present and are now mostly mature, with fully developed eggs. The differential grasshopper is beginning to mature, although most of them are still in the nymphal stage. The common Carolina locust (Dissosteira carolina L.) is maturing in the vicinity of Columbia and predicted to be as abundant as it was a year ago.

North Dakota. J. A. Munro (July 22): Flight dispersal of the more migratory species is commonly observed in practically all parts of the State. The migrations are especially pronounced in the south-central and southwestern areas. In general, the flights have been mainly in a northwestern direction, although flights in other directions have occurred on warm days with the prevailing wind currents. Observations made in the south-central area on July 2 showed the predominating species to be M. mexicanus, while inspection in the same locality 2 weeks later showed a marked shift in species, owing

apparently to M. mexicanus having dispersed by flight, leaving M. differentialis, M. packardii Scudd., and other less migratory forms relatively more abundant.

North Dakota. H. C. Severin (July 9): Many M. mexicanus and a few M. bivittatus were mature by June 22. At present, eggs of M. mexicanus, M. bivittatus, M. differentialis, and D. carolina are still hatching. Flights have occurred during the last 2 weeks. Considerable crops will be lost despite successful control measures, owing to so much idle land where the hoppers breed and from which they are migrating.

Nebraska. M. H. Swenk (July 23): Flights are commonly observed by the middle of July. The two-striped grasshopper was first noted as having reached the adult stage at Lincoln on June 18, and adults were numerous by June 24 over most of eastern Nebraska.

Kansas. J. R. Horton (July 22): A moderately heavy migration of grasshoppers observed passing over Wichita on several days during the first week of July, at the same time that the number of individuals in local fields decreased materially. The migrations are believed to have started here, or to have been joined by local hoppers; however, there are still many left, and they are doing considerable damage.

H. R. Bryson (July 28): Less abundant in the eastern and central parts of Kansas than earlier in the season. In the western part of the State they are still doing some damage but are mostly well under control.

Oklahoma. C. F. Stiles (July 22): Owing to the control program, grasshoppers have not damaged the crops severely in Oklahoma. The number of grasshoppers is greatly reduced in the northern part of the State through control measures and some natural enemies, but they are present in large numbers in the southwestern quarter of the State. The principal species are M. differentialis and M. packardii. M. bivittatus is rapidly disappearing, the same holding true for M. mexicanus. Nymphs of an undetermined species in the second and third instar are showing up in large numbers in Kay, Caddo, and Grady Counties, especially in alfalfa fields. A report from Cimarron County, the extreme Panhandle county of the State, states that D. longipennis Thos. are now flying into the county.

E. E. Ivy (July 25): Grasshoppers did considerable injury to young cotton at the edges of many of the fields in McCurtain County, southeastern corner of the State, early in the season, but at present the cotton is easily outgrowing the injury.

Montana. R. A. Sheals (July 30): Considerable crop loss occasioned during the last few weeks in eastern Montana by hordes of grasshoppers, which had migrated into agricultural areas from nearby breeding grounds in range lands or waste areas. Flights were so heavy that damage occurred despite extensive control measures.

Wyoming. G. F. Knowlton (July 12): Grasshoppers are more abundant and damaging than since 1931. Approximately 75 percent are adult in some localities, with large-scale hatching still occurring in some areas.

(July 25): Fungous disease killing many grasshoppers in the Paragonah-Parowan area, southwestern Utah. This occurred in 1937 but did not prevent heavy outbreaks in the area this year.

Nevada. G. G. Schweis (July 25): Grasshoppers, principally M. mexicanus, are occurring in great numbers and control campaigns are necessary in several counties. Much damage reported to second-crop alfalfa.

California. C. C. Wilson (July 8): Infestation by M. devastator Scudd. in the grazing land of the foothills of 15 counties is more serious than in 1937. In Lassen County more than 400 grasshoppers per square yard were present in alfalfa. In Little Shasta Valley, in Siskiyou County, serious damage to alfalfa and grain was experienced; whereas in the San Joaquin Valley they were less numerous than during the outbreak of 1936, although the population is still sufficient to cause damage. M. marginatus Scudd. and M. femur-nigrum Deg. appear to be increasing in the alfalfa fields of Sacramento County. The maximum count in one alfalfa field was 1,224, with a mean of 384 per square yard. The grasshoppers at this density, and mostly in the second and third instars, were sufficient to destroy 50 per cent of the second cutting of hay before it reached maturity.

C. S. Morley (July 8): One of the major insect problems in Kern County during the last month is the control of grasshoppers which have begun to come in on the agricultural crops from dry pasture land, where they have been more abundant than for many years.

MORMON CRICKET (Anabrus simplex Hald.)*

South Dakota. H. C. Severin (July): Mormon crickets are doing some damage. Fully 85 percent are adult. More crickets present than ever in the history of the State. For a complete report on the Mormon cricket see pp. 324 and 325.

Nebraska. M. H. Swenk (July 23): The easternmost points from which this pest has been reported in Nebraska are Oshkosh, Garden County, on July 15, and Purdon, Blaine County, in the center of the Nebraska sandhills, on July 20. In the latter locality they were plentiful, digging holes in the ground to a depth of 6 to 8 inches.

Nevada. G. G. Schweis (July 25): Mormon crickets are as abundant as in 1937, and a seemingly decided increase in the population westward.

WIREWORMS (Elateridae)

South Carolina. O. L. Cortwright (July 13): Unusually severe injury from wireworms, chiefly Horistonotus uhleri Horn, is being experienced in Colleton, Hampton, Jasper, Dorchester, Horry, and other coastal counties of the State during the present season. A considerable acreage of corn will be a complete failure because of the worms.

Iowa. C. J. Drake (July 20): Wireworms have damaged some corn in the vicinity of Hawarden and Dysart, some of the fields being very heavily infested.

* For a complete report on the Mormon cricket, see pp. 324 and 325.

North Dakota. J. A. Munro (July 22): Wireworms (Ludius aereipennis destructor Brown) averaged slightly more than one per plant in a potato field 2 miles east of Park River on July 12.

Nebraska. M. H. Swenk (July 23): From Dawson County on July 9 came a complaint of the wireworm, Monocrepidius vespertinus F., attacking the lower portion of cornstalks.

California. R. E. Campbell (July 1): Damage from the sugar-beet wireworm (Linonius californicus Mann.) is continuing in a large number of lima bean fields in Ventura County, southern part of the State, varying from no apparent damage to at least 50 percent. In several fields there were large bare spots several acres in extent, in which practically all of the plants had been killed, while in other fields damage was scattered throughout the field.

M. W. Stone (July 17): L. californicus larvae were observed feeding on young corn plants near Downey, Los Angeles County, as late as July 9. Damage was so severe that replanting of over 3 acres was necessary.

FALSE WIREWORMS (Eleodes spp.)

Kansas. J. R. Horton (July 22): Adults of the false wireworms, E. suturalis Say and E. tricolorata Say, seen more frequently in the Wichita area than during the last 2 years. Apparently they are on the increase, although not numerous at any point so far observed.

JAPANESE BEETLE (Popillia japonica Newm.)

New England. E. P. Felt (July 22): This pest has been much more abundant and destructive in southwestern New England and southeastern New York than in preceding years.

Connecticut. J. P. Johnson (July 22): Bridgeport, New Haven, Greenwich, Hartford, New London, Norwich, New Canaan, and Danbury are named in order of infestation. The first four towns are heavily infested in good-sized local areas. In the other towns the infestation ranges from general to light in localized areas. As a whole the beetle is very troublesome, and many small areas are comparable to New Jersey infestations.

Rhode Island. A. E. Stone (July 29): Japanese beetle increase tremendous in the older infestation, and there are quite a number of new places where they have never been previously reported.

New York. New York State Coll. Agr. News Letter (July 5): In Nassau County injury to corn has been reported from Great Neck. (July 18): At present they are more numerous than on the same date last year.

Delaware. L. A. Stearns (July 21): Peak of injury in New Castle County has been reached; marked increase in infestation in the northern part of Kent County as compared with 1937.

Maryland. The Baltimore Sun (July 22): Corn, apples, soybeans, and other crops ruined by the beetle in Cecil County. Over 20,000,000 beetles captured on two farms alone. Also reported from the Eastern and Western Shores as apparently increasing in numbers.

Virginia. H. G. Walker (July 26): The insect seems to be much more abundant at Norfolk and on the Eastern Shore of Virginia than ever before. Ninety beetles have been collected in traps at the Virginia Truck Experiment Station, as compared with 50 beetles last year. Several hundred beetles were collected on smartweeds in a field of potatoes in less than 30 minutes.

ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Connecticut. J. P. Johnson (July 22): More adults are being reported than usual. The infestation is general from New Haven to Greenwich, in the southwestern part of the State.

District of Columbia and Maryland. B. A. Porter (July 30): Reported as causing some damage at several points in the Petworth and Chevy Chase sections, Washington, D. C. An adult taken flying into a house at Takoma Park, Md.

A SCARABAEID (Ochrosidia villosa Burm.)

Connecticut. J. P. Johnson (July 22): First adults found in East Norwalk on June 24. Over 19,000 beetles captured in light traps on an estate from less than 3 acres. Believed that this insect is on the increase. No feeding of any kind by the adult observed.

GREEN JUNE BEETLE (Cotinis nitida L.)

Pennsylvania. H. E. Hodgkiss (July 26): A rather large infestation was observed at Harrisburg on July 20.

Ohio. T. H. Parks (July 25): Beetles received from Coshocton County on July 11 and from Butler County on July 18. They were clustered on ornamental vegetation.

Georgia. T. L. Bissell (July 22): Beetles are common and are doing some damage to figs at Experiment, central Georgia.

FULLER'S ROSE BEETLE (Pantomorus godmani Crotch)

Florida. J. R. Watson (July 22): Some damage was done to tung oil trees by this insect.

STALK BORER (Papaipema nebris nitela Guen.)

Vermont. H. L. Bailey (July 27): Reports indicate more than usual abundance of stalk borer in Washington County, central Vermont.

New York. N. Y. State Coll. Agr. News Letter (July 25): A bad infestation found in a commercial planting of tomato in Orange County, lower Hudson River Valley, on June 21. Over 30 percent of the plants were being killed.

- Maryland. E. N. Cory (July 1): Reported from Mount Savage, in the northwestern part of Maryland.
- Indiana. J. J. Davis (July 26): From June 18 to July 10 numerous complaints were received from all sections of the State. Most of the infestations were in field and sweet corn, although several were in garden plants, particularly dahlias.
- Ohio. T. H. Parks (July 25): This pest was very abundant in many parts of the State.
- Kentucky. M. L. Didlake (July 25): Common stalk borer reported injuring corn at Lexington and Covington on June 25 and tobacco at Eastwood on June 27. All localities are in the eastern half of the State.
- Michigan. R. Hutson (July 25): This pest reported on June 3 in tomatoes at Ferndale, and on hollyhocks on July 6 at Stockbridge. Both towns are in the southeastern part of Michigan.
- Wisconsin. E. L. Chambers (July 23): Reported from all sections of the State as attacking garden plants, potatoes, corn, and tomatoes.
- Missouri. L. Hasenan (July 23): This insect continued to do considerable damage during the first 2 weeks of July.
- Nebraska. M. H. Swenk (July 23): The stalk borer proved troublesome in Richardson, Cedar, and Saline Counties, all in eastern Nebraska, during the latter part of June. This pest was damaging raspberry stalks in Saline County.

BEET WEBWORM (Loxostege sticticalis L.)

- South Dakota. H. C. Severin (July): This webworm is locally abundant and damaging to gardens.
- Nebraska. M. H. Swenk (July 23): Complaints of damage to sugarbeets and other crops by this insect were received from Morrill, Cheyenne, Kimball, and Banner Counties, in the southwestern corner of Nebraska, during the latter part of June.
- Idaho. R. W. Haegeler (July 18): During early July countless moths were present over the green pea district in Valley County. By the 18th, many worms had hatched and necessary control measures were in progress.
- J. R. Douglass (July 25): Outbreak of the beet webworm in south-central Idaho, necessitating control measures over 4,000 acres of beets.
- Utah. G. F. Knowlton (July 9): Webworm moths are abundant in many northern localities. Some reports of crop injury have been received recently. (July 15): The larvae last week moved in large numbers from alfalfa and Russian-thistle into adjoining gardens.

MORMON CRICKET (Anabrus simplex Hald.)

- North Dakota. T. J. Schmitt, Jr. (July 29): Farmers in Emmons County estimate there are 50 times as many crickets present as last year, but so scattered that no damage is apparent. Concentrations becoming more noticeable in the hills and uncultivated fields. Bands now scattered in Burleigh County over a wide area. Half the townships in McIntosh County infested but infestation not heavy.
- South Dakota. T. J. Schmitt, Jr. (July 29): Lyman County lightly infested, with a moderate infestation on the Brule Indian Reservation, all crickets in the adult stage, females predominating. Oviposition in progress. Light infestations in Hand, Jerauld, and Buffalo Counties, with egg laying in progress on the high ridges. Peak of egg laying expected in about 2 weeks. Infestations in Potter, Walworth, and Campbell Counties apparently moved eastward onto agricultural and range lands. All crickets in the adult stage and egg laying taking place in Walworth and Potter Counties. About 30 to 40 thousand acres in north-central McPherson County lightly infested.
- Nebraska. T. J. Schmitt, Jr. (July 29): Infested area in Scotts Bluff County about 10 miles long and 6 miles wide. Population very light and widely scattered. Light infestations of Mormon cricket, or a related species, in Cheyenne, Garden, and Lincoln Counties.
- Montana. T. J. Schmitt, Jr. (July 29): Crickets in the adult stage throughout the State, and laying eggs quite heavily. Heavy migrations from the range and mountainous areas in Judith Basin County. Infestation greatly reduced in the Big Coulee area of Stillwater and Golden Valley Counties. Most of the egg beds in Sanders County found in lower areas.
- Wyoming. T. J. Schmitt, Jr. (July 29): Original infestation apparently in the Sixty-six Mountains on the state line between Nebraska and Wyoming. Crickets in Goshen County very heavily bunched and causing damage to wheat in this area 2 weeks ago, but now spread over several thousand acres of wheat and range lands. **Peak** of egg laying not expected for 2 or 3 weeks. Most of larger bands of crickets near crop areas in Sheridan and Johnson Counties destroyed, or scattered. Many small bands found to be breeding and laying eggs in areas where control operations have not been practical. Ovipositing in Campbell County.
- Idaho. T. J. Schmitt, Jr. (July 29): Control measures to be concluded in Elmore County on August 1. Production of alfalfa seed in this area liable to necessitate extra work. Oviposition not complete and some crickets still mating. In Washington County crickets in rather concentrated bunches, doing considerable damage to alfalfa seed. Exceptionally heavy migrations from the Forest Reserve toward agricultural areas in Fremont County, and considerable egg laying noted in the lower areas. A few crickets in the Camas meadow area still in the

7th instar. Exceptionally heavy migrations occurring against the permanent barrier in the Midvale area of Washington County, little crop damage resulting. Crickets laying heavily throughout the County. Wasps reported quite active on crickets in several regions. Crickets in Elmore County moving into alfalfa fields left for seed. Heavy oviposition in Blaine County.

Utah. T. J. Schmitt, Jr. (July 29): Egg laying still at its peak in the Eureka area of Juab County, but all large bands destroyed. Crickets not migrating but seeking egg-laying localities, chiefly on rocky south slopes of hills and in roadbeds.

Nevada. T. J. Schmitt, Jr. (July 29): Injury to cultivated crops noted near Elko, Elko County. Heavy injury in Sonoma Canyon, Pershing County, to cultivated and range lands. Injury of about 90 percent observed in a field of wheat and oats in Thomas Canyon, and heavy damage noted in the Indian Springs area. Area east of Golconda, along the Humboldt River, subject to several invading bands, migrating toward the river and scattering throughout alfalfa and grain fields in this area. The Jake-Kelly Creek infestation found to be widely scattered over about 90 square miles. New migrations found to be entering the Squaw Valley area. Little egg laying taking place over the area west of Elko City. A great number of wasp parasites, Palmodus laeviventris Cress., working on the crickets, as well as large bands of blackbirds feeding on them.

Washington. T. J. Schmitt, Jr. (July 29): No cricket movements observed in Franklin County, high temperatures contributing to increasing mortality of the adults. An adult survey made in Okanogan County during the week showed several light to moderate infestations of Steiroxys sp. and Apote notabilis Scudd., as well as 3 moderate to heavy infestations of undetermined cricket species. Egg laying under way generally.

Oregon. T. J. Schmitt, Jr. (July 29): Crickets moving into crop lands near Newbridge, Baker County, and in Wallowa County. In Gilliam County the infestation extends across all the northern part of the county. Both Mormon crickets and Apote notabilis present, the latter more numerous, in a generally light infestation. Small infestation in Sherman and Jefferson Counties. Both species of cricket occurring over about 100 sections of land in Wasco County, Mormon crickets being more numerous, eggs deposited over the whole area, and females still ovipositing. Infestations in Gilliam, Morrow, and adjacent counties found to cover a much larger area than believed infested, but infestations mostly light. Large numbers of crickets moving toward crop areas in Baker County.

CEREAL AND FORAGE - CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

ARMYWORM (*Cirphis unipuncta* Haw.)

Maine. J. H. Hawkins (July 20): The armyworm is occurring generally in outbreak numbers on corn, timothy, oats, and barley. Control measures in progress.

G. W. Simpson (July): Reported as damaging corn in home gardens at Presque Isle, northeastern Maine.

New Hampshire. J. G. Conklin (July 26): The present, very severe outbreak, is the first really serious one since 1919. The infestation covers practically the entire State, the most damage being found in towns bordering the Connecticut River, particularly in Grafton County, on the western edge of the State. Considerable damage has also been done in Rockingham County, in southern New Hampshire. Oats have received the greatest amount of damage, followed by corn, Hungarian and Japanese millet, and hay. In one case a field of 3 acres of cabbage was being badly riddled.

Vermont. R. D. Mallory (July 16): Oats and other crops have been completely destroyed in the vicinity of Fairlee, particularly around Bradford, across the Connecticut from Grafton County, N. H. Some farms are still free of the pest.

H. L. Bailey (July 27): First report of armyworm from Lunenburg, Essex County, northeastern Vermont, on July 11, most larvae about one-half to three-quarters grown. Infestation heaviest in Connecticut River Valley in Orange County, east-central Vermont, and Windham County, southeastern Vermont, and also found throughout Rutland County, southwestern Vermont. Pupation began in Windham County about July 17 and few larvae to be found on July 24. Outfields principal points of infestation and many severely damaged. Some cornfields also suffered.

Massachusetts. A. I. Bourne (July 23): Armyworms made a rather sudden appearance in several sections of the State. Reports of their presence and of rather serious feeding received from the eastern part of the State. No serious outbreaks have been reported thus far from the Connecticut Valley region or from Berkshire County to the west, although the pest was present in Amherst, and an outbreak was reported from Palmer on the eastern margin of Hampden County.

G. Erickson (July 9-15): An outbreak occurred at Palmer, in south-central Massachusetts, the armyworms first attracting attention on July 9, when, after hay had been cut on part of a 2-acre recreation lot, the caterpillars began migrating in all directions in search of food.

Connecticut. W. E. Britton (July 22): Larvae received from Orange, New Haven County, on June 24; reported on new grass along highway at Norwalk, Fairfield County, on July 5; on oats and grass at Ellington, Tolland County, on July 11; from Windham County as more prevalent than last year, 20 cases having been reported, several of them serious.

Rhode Island. A. E. Stone (July 29): Armyworms present in a greater number of places than last year and have damaged oat, corn, and clover.

New York. N. Y. State Coll. Agr. News Letter (July): Armyworms are occurring in outbreak numbers in Chautauqua, Allegany, Livingston, Monroe, Ontario, Orleans, Tompkins, Cayuga, Oswego, Jefferson, Saratoga, Columbia, Westchester, Ulster, Sullivan, Nassau, and Suffolk Counties.

Pennsylvania. H. E. Hodgkiss (July 26): Armyworms started to migrate on July 12, and were commencing to pupate on July 25 in Luzerne, Lackawanna, and Wyoming Counties, in northeastern Pennsylvania.

Michigan. R. Hutson (July 25): The armyworm was reported from Lakeview, Middleton, Bad Axe, and Breckenridge in the center of the Lower Peninsula during the middle of July.

Illinois. W. P. Flint (July 23): Second-brood armyworms are making their appearance in moderate numbers in the northern quarter of the State.

North Dakota. J. A. Munro (July 22): Spotted infestations reported from Cass, Traill, and Walsh Counties, on the eastern border of the State, injury occurring to oats, corn, and, to a lesser extent, to other crops. Some parasitization observed.

Iowa. C. J. Drake (July 20): Some damage in oatfields during the last week in Cedar County, east-central Iowa.

H. E. Jaques (July 24): Scattered reports of damage, principally from eastern Iowa.

HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (July 25): The wheat insect survey just completed shows that the infestation by counties averages 10.0 percent, compared with 4.3 percent in 1937.

Missouri. E. T. Jones (July 7): The freeze of April 7-10 materially reduced a spring infestation in many fields in southwestern Missouri. However, some infestation resulted, and a relatively heavy infestation of second-brood flies has built up in fields of late-sown wheat.

North Dakota. J. A. Munro (July 22): The hessian fly is scarce, only a few specimens taken in the Devils Lake vicinity, in the eastern part of the State.

Kansas. E. T. Jones (July 7): Observations in southern and eastern Kansas indicate that the first generation of flies was greatly reduced by the freeze of April 7-10. As a result present infestations are generally light, protected spots in a few scattered fields showing relatively high infestations. A few infestations from second-brood flies have been observed.

Oklahoma. E. T. Jones (July 7): General, scattered, very light infestations observed throughout northern Oklahoma in fields lacking in infestation last year.

A LEAFHOPPER (Cicadellidae)

New York. N. Y. State Coll. Agr. News Letter (July 11): An edge of a wheat-field in Cayuga County became severely infested with clover leafhoppers when an adjacent meadow was cut for hay. The infestation was very severe within a rod or two of the meadow, but beyond that negligible. There were 25 to 30 hoppers on many of the wheat heads. Several fields checked showed the hoppers serious only in fields adjacent to mowed meadows.

CORN

CORN EAR WORM (Heliothis obsoleta F.)

New York. L. A. Carruth (July 29): First-brood infestations found to be remarkably low on western Long Island. Usually some serious commercial injury found in July but none this year. Pupae recovered from diggings in a field heavily infested last season have been reared to moths.

Delaware. L. A. Stearns (July 18): Infestation is reported from Smyrna, in Kent County.

Virginia. H. G. Walker (July 26): Damage to sweet corn has been unusually light in the Norfolk district and many fields of tomatoes are practically free from injury.

Georgia. C. H. Alden (July 21): Larvae are doing considerable feeding on ears of corn and some damage to tomatoes at Cornelia, northern Georgia.

Indiana. J. J. Davis (July 26): Not conspicuously abundant although specimens were collected feeding in green tomato fruits the first week in July.

Kentucky. M. L. Didlake (July 25): The corn ear worm is unusually abundant.

Mississippi. C. Lyle (July 25): Severe damage to corn in southern Mississippi. Medium damage to both tomatoes and corn in east-central Mississippi.

Louisiana. B. A. Osterberger and E. R. Lett (July): Eggs are fairly numerous at Baton Rouge on the late corn. Adults noticed on cloudy days in flight.

Wisconsin. E. L. Chambers (July 23): Reported from many sections of the State as doing some damage, principally to sweet corn and tomatoes.

Missouri. L. Haseman (July 23): In the vicinity of Columbia sweet corn ears showed considerable infestation during the second week of July and caterpillars had pupated by July 20. Over the State generally the pest has seemingly not attracted much attention.

Kansas. H. R. Bryson (July 28): Some injury to early sweet corn reported.

Utah. G. F. Knowlton (July 22): Larvae have damaged early sweet corn now on the market at Logan, Willard, and Salt Lake, in north-central Utah.

Nevada. G. G. Schweis (July 25): Several reports that corn ear worms are present in the usual numbers.

FALL ARMYWORM (Laphygma frugiperda S. & A.)

Mississippi. C. Lyle (July 25): Several patches of late corn badly damaged in southern Mississippi. Complaints of severe damage to corn in the Delta section.

Arkansas. D. Isely (July 20): A small local outbreak on corn observed in Washington County, northwestern Arkansas, on July 19.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Connecticut. N. Turner (July 20): Very serious damage to early sweet corn in the Housatonic Valley. Infestation in other areas is about as usual. Most of the insects in the pupal stage. In a commercial flower garden daisies and artemisias were very badly damaged.

New York. N. Y. State Coll. Agr. News Letter (July): In Rockland and Ulster Counties fields in tassel were observed on July 5 and 6, in which 90 to 100 percent of the stalks were infested by first-generation larvae, most of which were half-grown or larger. Fields of younger corn were lightly or moderately infested. On Long Island a potato field near East Meadows was examined on July 9. Examination of 100 newly dug vines disclosed 222 larvae in all stages of development and 8 pupae in 10 vines, together with traces of feeding. (July 25): Infestation of corn borer is 100 percent in early planted sweet corn in the southern part of Saratoga County. The first planting, now being harvested, shows 100-percent infestation; the second, a large amount of tassel topping; and the third planting shows infestation.

L. A. Carruth (July 29): A survey of first brood of the 2-generation strain in sweet corn shows most severe infestations in Albany County, where damage to stalks and ears was so severe that no attempts were made to harvest some fields. Surveys in the county indicate approximately 10-percent pupation, although an empty pupal case has occasionally been found. Egg masses found in two fields on low land west of Albany on July 28.

New Jersey. T. L. Guyton (July 14): Larvae are very numerous in sweet corn. The stalk infestation is approximately 100 percent at Bound Brook, north-central New Jersey.

Indiana. J. J. Davis (July 26): This pest is definitely on the increase. A noticeably large percentage is pupating, indicating the development of the 2-brooded form, especially as the borer moves southward.

Wisconsin. E. L. Chambers (July 23): First infestation found on July 18 on sweet corn in Kenosha County, southeastern Wisconsin.

CORN ROOTWORM (Diabrotica longicornis Say)

Tennessee. G. M. Bentley (July 23): Reported on July 14, as damaging corn in Obion and Tipton Counties, western Tennessee. Larvae were found eating the roots to such an extent that the stalks fell over. Adults on July 14 occurred in large numbers and fed not only on corn but upon soybeans planted with the corn. (Det. by A. G. Boving.)

SOUTHERN CORN ROOTWORM (Diabrotica duodecimpunctata F.)

Kentucky. M. L. Didlake (July 25): Considerable injury to corn appeared on the station farm in the vicinity of Lexington.

Mississippi. C. Lyle (July 25): Reported from Poplarville, southern Mississippi, that this insect has inflicted heavy damage to the corn crop in that section.

Iowa. C. J. Drake (July 20): The southern corn rootworm was observed in cornfields in the vicinity of DeWitt and Osterdock, easternmost part of Iowa.

CHINCH BUG (Blissus leucopterus Say)

Ohio. T. H. Parks (July 25): No serious outbreaks occurred but damage reported to corn on one farm in each of three counties, Union, Morgan, and Clinton in central and south-central Ohio. Bugs were discovered the second week of July, many of them having already moved into the corn. Most of the bugs have reached the adult stage.

Indiana. J. J. Davis (July 26): Although outbreaks of chinch bugs threatened during the latter part of June, none became serious. The counties where the bugs occurred in noticeable numbers included Knox, Daviess, Martin, Montgomery, Greene, and Clay, the southernmost point of abundance for 20 years.

Illinois. W. P. Flint (July 23): Heavy rains during the last month have largely done away with the threat of any damage.

Michigan. R. Hutson (July 25): A small infestation was reported from Monroe, in the southeastern corner of Michigan, on July 16.

Missouri. L. Haseman (July 23): The chinch bug has continued to attract some attention and call for control work in a number of counties scattered mostly from the central part of the State north to the Iowa border.

Iowa. C. J. Drake (July 20): Chinch bugs are fairly abundant in the southern two tiers of counties, and in central and western Iowa, extending deeply into the fourth tier of counties. Only a limited amount of damage in the small-grain fields but throughout most of the infested area, the population was large enough to destroy all the grasses in the wheat, oat, and barley fields. In a number of counties a few fields of corn have been badly injured or totally destroyed. The infestation in Audubon County is greater than in 1934.

Texas. R. K. Fletcher (July 22): Reported as seriously injuring grain sorghum in Ellis and Throckmorton Counties, in north-central Texas, and injuring corn in Victoria County, southeastern coast of Texas.

CORN LEAF APHID (Aphis maidis Fitch)

Florida. J. R. Watson (July 22): A heavy infestation occurred on the station grounds at Gainesville.

Illinois. A. F. Satterthwait (July 26): The corn leaf aphid is occurring in outbreak numbers in a large field of corn near Reynoldsville, Union County, southern Illinois, destroying tassels, foliage, and stalks to an extent indicating a probable loss of 33 to 40 percent of the crop.

Iowa. C. J. Drake (July 20): Infestations of the corn leaf aphid have been observed in the vicinity of Des Moines.

North Dakota. J. A. Munro (July 27): Infestation is generally distributed throughout a 225-acre field of corn near Gardner, Cass County. Practically all plants are heavily infested. Natural control agencies, including the larvae of syrphid flies and ladybird beetles, were active.

Nebraska. M. H. Swenk (July 23): Heavily infested cornstalks received from Buffalo County, south-central Nebraska, on July 19.

TERMITES (Isoptera)

Ohio. T. H. Parks (July 25): Specimens of green cornstalks received from Adams County, in southern Ohio, on July 5, showed termite injury. Some insects were present in the hollowed-out stalks. This is our first experience with termites in green corn.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

Nebraska, Colorado, and Wyoming. J. C. Hamlin (July 2): As a result of a survey this insect was found in the following localities not previously known to be infested: Harrisburg, Banner County; Hemingford, Box Butte County; and Kimball, Kimball County; all in western Nebraska; Hereford, Weld County, in northeastern Colorado; Thermopolis, Hot Springs County; Worland, Washakie County; and Bairden, Big Horn County; all in north-central Wyoming; Pine Bluffs, Laramie County, in southeastern Wyoming. Also found in Marsland, Daves County, Nebr., where it has been recorded previously. (Det. by L. L. Buchanan and A. G. Boving.)

Nevada. G. G. Schweis (July 25): An outbreak of alfalfa weevil in Douglas County, southwestern Nevada, and much damage done to the first-cutting alfalfa.

Oregon. R. W. Bunn (July 6): An extension of the infestation in southwestern Oregon discovered this year, larvae being found in small numbers in the

southern part of Douglas County. Appraisal of first crop damage in the Rogue River Valley, Jackson County, the center of this infestation, revealed that damage was not severe in most cases, although approximately one-fourth of the fields were damaged to some extent.

THREE-CORNERED ALFALFA HOPPER (Stictocephala festina Say)

Louisiana. L. O. Ellisor (July): Very abundant in alfalfa and soybeans throughout the State.

CLOVER

A LEAFHOPPER (Aceratagallia uhleri Van D.)

Nebraska. M. H. Swenk (July 23): Abundant on red clover plants in Lancaster County, southeastern Nebraska, during the period from June 21 to July 20.

A PLANT BUG (Miridae)

Virginia. A. M. Woodside (July 20): Some fields of red clover in Augusta County, in northwestern Virginia, are being severely damaged by a small black mirid. It feeds also on white clover, but has damaged it less. Also observed feeding on several species of weeds.

SOYBEAN

VELVETBEAN CATERPILLAR (Anticarsia gemmatilis Hbn.)

Louisiana. L. O. Ellisor (July): First-, second-, and third-instar larvae were taken in fields of soybeans on July 19 and 20 at Grand Isle, Houma, Franklin, and Plaquemine, all in south-central Louisiana.

COWPEAS

COWPEA CURCULIO (Chalcodermes aeneus Boh.)

South Carolina. J. N. Todd (July 26): The first generation of cowpea pod weevil is entering the pupal stage at Clemson, in northwestern South Carolina. Many fields show heavy infestation.

Georgia. T. L. Bissell (July 3): The number of overwintered adults collecting on cowpeas and beans at Experiment has been increasing the last week. No eggs can be found in the beans though the pods are being punctured. (July 26): The first adult of the first generation has emerged in a cage. Peas are not so severely punctured as they were 10 days ago.

CORRECTION: The note for May 19 on page 167 of the Survey Bulletin for June should read C. aeneus and not C. collaris Horn.

CROTALARIA

BELLA MOTH (Utetheisa bella L.)

Mississippi. C. Lyle (July 25): Larvae collected from crotolaria, and sent on July 22 from New Albany, Union County, in the northern part of the State.

FRUIT INSECTS

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

- Iowa. C. J. Drake (July 20): Observed damaging apple trees through central and eastern Iowa.
- Nebraska. M. H. Swenk (July 23): Complaints of damage to several species of elm and hackberry trees received between June 21 to July 20, from locations scattered throughout the State.
- Kansas. H. R. Bryson (July 28): Borers, particularly flatheaded apple tree borers, are quite abundant but reports of injury fewer than last year.
- Oklahoma. F. A. Fenton (July 22): This pest is far less numerous than it has been in years, and at present, there is comparatively little oviposition.
- Utah. G. F. Knowlton (July 6): These borers have damaged apple and maple trees at Hyrum, in northern Utah.

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

- Tennessee. G. M. Bentley (July 23): Found to be badly infesting Chinese arborvitae at Woodbine, Davidson County.
- Idaho. R. W. Haegelo (July 5): During June large numbers of these beetles were found in scattered prune orchards in Ada, Canyon, and Payette Counties, southwestern Idaho, greater numbers than usual being present.

BUFFALO TREEHOPPER (Ceresa bubalus F.)

- Michigan. R. Hutson (July 25): Adults collected on pear in Berrien County, southwestern part of the State, on July 10.
- Missouri. L. Haseman (July 23): Adults are abundant on various garden plants and shrubs.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

- Ohio. E. W. Mendenhall (July 21): Found in an apple in a nursery at Cambridge, in east-central Ohio. The outbreak was rather severe.
- G. A. Runner (July): Reports indicate some increase of San Jose scale in the Sandusky area, north-central Ohio, over 1937.
- Wisconsin. E. L. Chambers (July 23): Much less scale than usual.
- Georgia. O. I. Snapp (July 15): Infestation on peach trees at Fort Valley, central Georgia, is still less than that of an average year.
- Oklahoma. F. A. Fenton (July 22): Reported as killing peach trees in Wister, LeFlore County, on the eastern border of the State.

Texas. R. K. Fletcher (July 22): The scale injured fruit and pecan trees in Tarrant County, northeastern Texas.

A RUST MITE (Phyllocoptes schlechtendali Nal.)

Washington. E. J. Newcomer (July 19): Reported to be more numerous than usual on apple and pear in the Yakima Valley.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (July 23): Spring-brood moths have not been captured in bait traps since July 8. Weather conditions since July 10 have been unfavorable for both larval and adult activity. Injury to fruit in most orchards appears to be considerably lighter than it was at a similar period during the last two seasons.

Delaware. L. A. Stearns (July 23): Break in moth activity between the spring and first broods, as determined by bait trap records from June 28 to July 8, inclusive. First-brood moths are now being captured in large numbers in the State and second-brood entries are increasing.

Virginia. A. M. Woodside (July 20): Infestation of apples in the Staunton vicinity considerably lighter than last year, but now on the increase. Catch of moths in bait traps light since the completion of emergence of spring-brood moths.

Georgia. C. H. Alden (July 21): The infestation in apples at Cornelia, northern Georgia, is from light to moderate.

Ohio. T. H. Parks (July 25): Owing to weather conditions during June, first-brood codling moth development was retarded, and second-brood adults did not appear until the middle of July at Columbus. The indications now point to a lighter second-brood infestation than a year ago.

G. A. Runner (July): First-brood infestation in the Sandusky area, somewhat lighter than in 1937.

Indiana. L. F. Steiner (July 26): Emergence of first-brood adults at Vincennes, in southwestern Indiana, has apparently passed its peak. Egg deposition by this brood was at its maximum about July 11 and again on July 18. Bait traps in 3 orchards failed to show any outstanding peak catches. The adult population in an unsprayed orchard increased from 15 moths per tree on June 22. to 30 on July 20. In one orchard, trees which received only a calyx spray averaged 118 worm entrances per 100 apples at the close of first-brood attack.

Illinois. W. P. Flint (July 23): The moth is about normal in abundance.

Michigan. R. Hutson (July 25): Second-brood moths began to appear in the northern half of the Lower Peninsula as follows: Vandalia on July 19; Monroe, Eau

Claire, and Allegan on July 18; Buchanan, Saint Joseph, and Lapeer on July 20; and Kibbie, Albion, Ann Arbor, and Birmingham on July 21.

Minnesota. A. G. Ruggles and assistants. (July): A few orchards near Minneapolis show 20 percent of the fruit affected.

Missouri. L. Haseman (July 23): The July brood of codling moths reached its peak in the southern part of the State during the first 10 days in July, in central Missouri around the middle of July, and in the northern part of the State around July 20. Attracting less attention than usual.

Nevada. G. G. Schweis (July 25): Codling moths abundant, and all unsprayed apples 100 percent wormy.

YELLOW-NECKED CATERPILLAR (Datana ministra Drury)

Missouri. L. Haseman (July 23): More abundant than usual at least in central Missouri, and unsprayed trees have been rather severely stripped. Most of the caterpillars had begun to pupate in rearing cages by July 20.

PISTOL CASEBEARER (Coleophora malvorella Riley)

Pennsylvania. H. E. Hodgkiss (July 26): Adults emerged in Adams County, south-central Pennsylvania, on June 18. First eggs observed on June 21, and very abundant by June 30. The peak of moth emergence occurred from June 25 to 27. On July 6 approximately 95 percent of the adults had emerged. Second-generation young were present on July 10.

APPLE LEAF SKELETONIZER (Psorosina hammondi Riley)

Missouri. L. Haseman (July 23): During the first half of July a rather heavy population of this insect appeared over much of the State; and considerable damage occurred on young orchards and those where there was no fruit crop.

APPLE LEAF TRUMPET MINER (Tischeria malifoliella Clem.)

South Carolina. J. A. Berly (July 26): Rather heavy infestation on crab apple at Columbia.

ROSY APPLE APHID (Anuraphis roseus Baker)

Connecticut. P. Garman (July 21): More abundant than last year, especially in the southern half of the State. Infestations generally light in northern part. Migration from apple complete by last week in June.

New York. N.Y. State Coll. Agr. News Letter (July 5): In a few orchards in Wayne County, western New York, where early control measures were lacking, rosy aphids are causing serious damage.

Maryland. E. N. Cory (July 23): Considerable injury noted at various points in the State.

Minnesota. A. G. Ruggles and assistants. (July): Rosy apple aphid very abundant on apple trees in Clay County, western Minnesota.

Missouri. H. Baker (July 5): This aphid, which has been very scarce in this section during the last few years, was observed as present in small numbers in several orchards in the vicinity of St. Joseph and DeKalb, in northwestern Missouri, during the period from May 12 to June 1. Damage was not important.

Kansas. H. Baker (July 5): Observed as present in small numbers in several orchards in the vicinity of Wathona, Blair, and Troy, in the northeastern part of the State. No severe damage.

APPLE APHID (Aphis pomi Deg.)

Maine. F. H. Lathrop (July 22): Comparatively cool, rainy weather during mid-summer has favored the development of aphids, and the numbers are increasing in apple orchards in Monmouth, Kennebec County, in the south-central part of the State. They are not present in outbreak numbers.

New York. N. Y. State Coll. Agr. News Letter (July): Becoming quite numerous over the State.

WOOLLY APPLE APHID (Eriosoma lanigerum Hausm.)

Utah. G. F. Knowlton (July 23): Colonies, heavily infested with parasites, were observed at Salt Lake and Midvale.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

Maine. F. H. Lathrop (July 23): First flies appeared in emergence cages at Monmouth on June 22. Peak of emergence was reached during the period of July 15 to 22. Flies are present in normal numbers on neglected trees.

New York. N. Y. State Coll. Agr. News Letter (July): Reported that emergence of flies in the Hudson Valley increased considerably during the period from June 28 to July 1. In Columbia County the infestation is heavy in unsprayed orchards and flies are still abundant.

APPLE SEED CHALCID (Callinome druparum Boh.)

Maine. F. H. Lathrop (July 22): First emergence in experimental cages at Monmouth, occurred on June 12. The peak of emergence occurred during the week beginning on June 17.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Massachusetts. A. I. Bourne (July 23): Becoming abundant, particularly in orchard or blocks where control measures were omitted late in winter or early in the spring. However, rainfall has been sufficient to check the activities of the mites so that they do not seem to be causing any serious injury.

- Connecticut. P. Garman (July 21): Browning of foliage is prevalent in many orchards in the State and is more prevalent than last month.
- New York. N. Y. State Coll. Agr. News Letter (July): Noticeable damage was present in some apple orchards in the Hudson River Valley. In the western part of the State red mites on prunes were causing some bronzing in orchards and were alarmingly abundant in some places.
- Delaware. L. A. Stearns (July 8): Generally severe on both peach and apple, where usual spray for this pest was omitted.
- Ohio. T. H. Parks (July 25): Quite abundant during the last two weeks on apple foliage in many orchards.

PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

- Connecticut. P. Garman (July 21): First generation light to medium in abundance. Second generation appearing in considerable numbers. Parasitism more generally present than in 1937.
- New York. N. Y. State Coll. Agr. News Letter. (July 5): Larvae are taking a big toll on the terminals of young peaches in Orleans County, western part of the State.
- Delaware. L. A. Stearns (July 23): Second- as well as first-brood larvae are heavily parasitized. The prospect is for a light infestation.
- South Carolina. O. L. Cartwright (July 26): Most commercial orchards escaped serious injury in spite of unusually heavy twig infestation. Worry fruit generally about 2 percent, although one Piedmont orchard showed 15 percent damage.
- Virginia. A. M. Woodside (July 20): Infestation of peaches in Augusta County, northwestern Virginia, is heavier than for several years.
- Georgia. O. I. Snapp (July 5): Of 23,499 ripe peaches cut and examined only 9, or 0.04 percent, was found to be infested. These peaches were from an orchard at Fort Valley in which no control measures were enforced.
- C. H. Alden (July 21): This insect is on the increase in central and northern Georgia peach sections, and more twig and fruit injury has been observed and reported than for the last three years. As high as 9 percent of the harvested peaches have been infested.
- Ohio. G. A. Runner (July): Heavy twig infestation in all peach orchards observed in the Sandusky area. Twig injury during early summer apparently was much heavier than in 1937.
- Kentucky. M. L. Didlake (July 23): Still abundant in many orchards at Lexington. Third-generation larvae began entering twigs about July 15.

Mississippi. C. Lyle (July 25): On June 28 a correspondent at Houston, Chickasaw County, in the northern part of the State, sent in a number of injured peach twigs.

Michigan. R. Hutson (July 25): Has been active in the southern half of the Lower Peninsula, in the vicinities of Grand Rapids, South Haven, Benton Harbor, Rochester, Northville, and Pontiac.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Maine. F. H. Lathrop (July 22): Peak of abundance of adults in apple trees occurred during the week ending June 25. Larvae began leaving apples during the last week in June, at Monmouth. Throughout the State injury is distinctly more severe than last year.

New York. N. Y. State Coll. Agr. News Letter (July): In Ulster County, in the lower Hudson River Valley, one orchard was observed where larvae have caused considerable loss in sour cherries. Larvae in peaches have caused a heavy drop of fruit in the same area.

Delaware. L. A. Stearns (July 23): Jarring data show no peak of first-brood emergence during early July such as usually recorded; departure from normal possibly due to prolonged period of heavy rain.

Virginia. A. M. Woodside (July 20): Adults of the first summer brood are common in peach orchards of Albemarle County, in north-central Virginia. Oviposition in the insectary has been light.

Georgia. O. I. Snapp (July 15): Peaches in central Georgia were attacked by a heavy second brood of larvae. Conditions were very favorable for the development of new beetles in the soil and frequent rains in June facilitated emergence. There was heavy emergence late in May and in June. Second-generation egg deposition was heavy late in June, resulting in many wormy peaches of the late-maturing varieties. Fifty-one percent of the new beetles had deposited second-generation eggs by July 14. The infestation increased so rapidly late in June that it is now heavier than that of an average year.

C. H. Alden (July 21): Less than 1 percent of the peaches being harvested at Cornelia is infested, the lightest infestation in this section in several years.

Mississippi. C. Lyle and assistants (July 25): Severe damage to unsprayed peaches reported in the southwestern and east-central parts of the State.

Ohio. T. H. Parks (July 25): After 8 years of comparative freedom from this insect the peach crop is now infested. In one orchard, visited on July 22, the infestation was heavier than that of the Oriental fruit moth. No serious damage has occurred to apples.

Michigan. R. Hutson (July 25): This pest has been very active on the Lower Peninsula in the vicinity of Marquette and unusually severe at Grand Rapids, Farmington, and Augusta in the same area.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

New York. N. Y. State Coll. Agr. News Letter (July): In eastern New York the pest generally is not now serious enough to warrant control measures. In the western part of the State it has been found abundant in a few orchards so that control for the second-brood nymphs will be necessary. Changing over into the fly stage quite rapidly.

PEAR LEAF BLISTER MITE (Eriophyes pyri Pgst.)

Ohio. T. H. Parks (July 25): Infested pear leaves were received from Ashtabula County, northeastern corner of the State, with a statement that the pest was causing serious injury.

CHERRY

CHERRY FRUITFLIES (Rhagoletis spp.)

New York. D. W. Hamilton (July 23): Emergence of adults of R. cingulata Loew, as indicated by field emergence cages in Columbia County, eastern New York, was completed on July 1. A few flies still active in orchards on July 21. Peak emergence occurred from June 13 to June 24.

N. Y. State Coll. Agr. News Letter. (July 11): A little more maggot in cherries in Niagara County than for several years.

Ohio. G. A. Runner (July): More than usually abundant in the Sandusky area, especially in the later ripening varieties of sweet cherries.

PEAR SLUG (Eriocampoides linacina Retz.)

New York. R. E. Horsey (July): Request for information about control on cherry received on July 8. Since reported as common on pear and cherry in Irondequoit Township near Rochester.

N. Y. State Coll. Agr. News Letter. (July 11): In Niagara County a heavy infestation was found on sour cherries and some nursery stock.

Ohio. T. H. Parks (July 25): Reported as injuring pear and cherry trees all through June and July, and as much more common than usual.

Utah. G. F. Knowlton (July 22): Damaging cherry foliage in northern Utah; also in Salt Lake and Davis County orchards, cherry and pear trees have been damaged.

PLUM

APHIDS (Aphididae)

Nebraska. M. H. Swenk (July 23): The rusty plum aphid (Hysterononeura setariae Thos.) was reported from Antelope County, in northeastern Nebraska, on July 16 as attacking plum trees.

Utah. G. F. Knowlton (July 7): The thistle aphid (Anuraphis cardui L.) has seriously curled plum foliage at Tooele, in northern Utah. Three species of aphids are present on the foliage but this species is the most conspicuous.

RASPBERRY

AN APHID (Amphrophora rubi Kltb.)

Maryland. F. F. Smith (July 27): Raspberry plants at Beltsville have become infected with red raspberry mosaic during each of the last several years. Examinations have been made several times each season for the aphid vector, but none were taken in these plantings until June 16, 1938.

BORDERED PLANT BUG (Euryophthalmus convivus Stal)

Arizona. C. D. Lebert (July 20): Many adults were observed on beans, raspberries, loganberries, and blackberries in the East Verde River district. No nymphs and no pronounced damage found.

RASPBERRY FRUITWORM (Dyturus unicolor Say)

Ohio. E. W. Mendenhall (July 15): These are abundant in the fruit of the red raspberry plants in central Ohio, and are causing some damage.

Wisconsin. E. L. Chambers (July 23): Quite a number of raspberry plantings in the southern part of the State reported as infested.

Washington. W. W. Baker (June 26): Observed on raspberry and thimbleberry at Skykomish, King County, western Washington, and at Conconully, Okanogan County, north-central Washington, the latter being the first record for the County.

RASPBERRY CANE BORER (Oberea bimaculata Oliv.)

New York. N. Y. State Coll. Agr. News Letter. (July 18): In eastern New York the raspberry cane borer is causing the wilting and death of young raspberry canes. Well-grown larvae found near the tips of the shoots.

Virginia. G. E. Matheny (July 18): Reported on raspberry in Bland County, western Virginia. This is the first report from this locality. (Det. by W. J. Schoene.)

RASPBERRY CANE MAGGOT (Pegomyia rubivora Coq.)

Massachusetts. A. I. Bourne (July 23): Abundant in Essex County, in the northeastern section of the State and causing considerable damage.

Minnesota. A. G. Ruggles and assistants (July): Very abundant in Ramsey and Hennepin Counties in the southeastern part of the State, and in some instances has done very great injury.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

- New York. N. Y. State Coll. Agr. News Letter (July): In the Hudson Valley nymphs are hatching rapidly. They are unusually abundant and threaten to become destructive unless control measures are used. In the western part of the State they are causing serious damage. A few are winged, but the majority are in the nymphal stage.
- Ohio. G. A. Runner (July): Less than the usual damage to early appearing grape foliage in the Sandusky area, caused by overwintering adults. Hatching and development of the first brood of nymphs earlier than usual.
- Missouri. L. Haseman (July 23): Hoppers are beginning to do some damage to the foliage of susceptible varieties.
- South Dakota. H. C. Severin (July): The pest is getting very abundant and is causing some damage.
- Nebraska. M. H. Swenk (July 23): The insect was reported as injurious to woodbine vines in Holt County, in northern Nebraska, on July 8.
- Utah. G. F. Knowlton (July 9): In north-central Utah, at Farmington, Roy and Provo, the insects are seriously injuring some varieties of grapes.

EIGHT-SPOTTED FORESTER (Alypia octomaculata F.)

- Michigan. R. Hutson (July 25): Reported on grape at Flint, Genesee County, in the Lower Peninsula.
- South Dakota. H. C. Severin (July): Unusually abundant and working on grape and related plants.
- Nebraska. M. H. Swenk (July 23): Received from Furnas County, on the southern border of the State, on June 27.

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

- Ohio. G. A. Runner (July): Damage from first-brood larvae in the Sandusky area was more severe than in 1937 owing to concentration of the moths on the extremely light crop. Records from overwintered material show winter survival of approximately 79 percent. Heaviest emergence of the spring brood of moths during the period June 5 to 10, or about 2 weeks earlier than usual. Emergence of moths of the second brood commenced on about July 20. In the field on July 25 most of the cocoons on the vines contained pupae.

A PHYLLOXERA (Phylloxera sp.)

- North Dakota. J. A. Munro (July 22): A severe infestation of phylloxera observed on grapes in Fargo, eastern part of the State, during the first part of July.

PECAN

PECAN WEEVIL (Curculio caryae Horn)

Georgia. T. L. Bissell (July 28): Appearing in small numbers in Spalding and Lamar Counties, in west-central Georgia, 22 weevils being jarred from 13 trees on July 26 and 27.

Louisiana. L. O. Ellisor (July): Heavy damage has occurred at Marksville, central Louisiana.

HICKORY-NUT CURCULIO (Conotrachelus affinis Boh.)

Mississippi. C. Lyle (July 25): A number of pecan drops received from Yazoo City, in the west-central part of the State on July 22. Many of them were infested.

FALL WEDWORM (Hyphantria cunea Drury)

Georgia. O. I. Snapp (July 1): The first generation on pecan is now more abundant than usual at Fort Valley.

Florida. J. R. Watson (July 22): Pecans and wild persimmons are being rather heavily attacked.

PECAN CIGAR CASEBEARER (Coleophora caryaefoliella Clem.)

Mississippi. C. Lyle (July 25): Pecan twigs sent in on July 18 from Sunflower County in the Delta, show infestation.

BLACK PECAN APHID (Melanocallis caryaefoliae Davis)

Louisiana. L. A. Hetrick (July 19): Specimens of this aphid taken at New Orleans. Apparently there is some disease transmission associated with the species. They were attended by the Argentine ant (Iridomyrmex humilis Mayr).

WALNUT

RED-HUMPED CATERPILLAR (Schizura concinna S. & A.)

Kentucky. M. L. Didlake (July 25): Reported injuring sweetgum at Lexington on July 9.

California. D. F. Barnes and C. K. Fisher (July): On October 5 and 7, 1937, defoliation noted on about four miles of roadside black walnut trees northwest of Fresno. The damage ranged from heavy feeding to complete defoliation on many trees. The trees had been grafted to English walnuts, branches of both varieties being present on a single tree. English walnut was preferred. Full-grown larvae were collected on October 7. Pupation occurred soon after collection. The pupae were held at room temperature during the winter and emergence began between March 29 and April 2, 1938 and was complete by April 7. Parasitization by Apanteles schizurae

Ashm. was found in the field. Parasitized larvae were collected and held during the winter and emergence of parasites began on April 6.

G. H. Kaloostian (July 5): Two small branches of black walnut, 10 to 15 feet above the ground, at Fowler, near Fresno, were defoliated. This was the first appearance of the pest this year. A plum tree in the same locality was not infested although both the walnut and the plum were infested last year.

PERSIMMON

PERSIMMON PSYLLA (Trioza diospyri Ashm.)

Mississippi. C. Lyle (July 25): Persimmon leaves infested with this pest recently received from a correspondent at Lumberton, Lamar County, in the southern part of the State.

CITRUS

ORANGE TORTRIX (Argyrotaenia citrana Fern.)

California. A. M. Boyce (July 25): Orange tortrix is more abundant than noted before in the entire navel areas in southern California. In many orchards infestations of from 75-100 percent are common, the small larvae feeding under the buttons.

CITRUS WHITEFLIES (Aleyrodidae)

Florida. J. K. Holloway (July 27): Dialeurodes citri Ashm. and D. citrifolia Morg. completed oviposition the first week in July. In central Florida the dominant species of the summer generation is the cloudy-winged whitefly. On July 19 the summer generation had advanced to 2nd- and 3rd-stage nymphs. Aleurothrixus howardi Quaint. is beginning to build up in this section.

CITRUS MEALYBUG (Pseudococcus citri Risso)

Florida. H. Spencer (July 22): Citrus mealybugs are still increasing on citrus in the central part of Florida.

PURPLE SCALE (Lepidosaphes beckii Newm.)

Florida. H. Spencer (July 27): Spreading quite rapidly from the twigs and older leaves to the new flush of growth and the fruit in central Florida. This spring the leaves were relatively free from scale infestation but they were present on the wood.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. H. Spencer (July 27): Have been hard to control this summer in central Florida because of frequent rain. Fruit that has not been protected by spraying or dusting is heavily russeted.

FIG

OLEANDER CATERPILLAR (Syntomeida epilais Walk.)

Florida. J. R. Watson (July 22): The larvae of the polka dot wasp moth were sent in from St. Augustine, in northeastern Florida, reported as feeding on figs.

TRUCK-CROP INSECTS

WHITE-FRINGED BEETLE (Naupactus leucoloma Boh.)

Alabama. R. A. Sheals (July 30): Reported for the first time at the following localities: Monroeville, Monroe County, and Conecuh County, both in south-central Alabama; and Mobile, Mobile County.

Mississippi. R. A. Sheals (July 30): First record of the beetle at the following places: Pass Christian and Gulfport, Harrison County, on the Gulf; and Bolton, Hinds County, just south of west-central Mississippi.

Louisiana. R. A. Sheals (July 30): An extension of the area infested by this insect around New Orleans has been reported.

BLISTER BEETLES (Meloidae)

South Carolina. J. G. Watts (July): One report of damage by the striped blister beetle (Epicauta vittata F.) at Blackville, southwestern South Carolina, on soybeans. A few specimens taken in a trap light on several occasions during the month.

Indiana. J. J. Davis (July 26): Several species are destructively abundant in vegetable and flower gardens in many sections of the State.

Kentucky. M. L. Didlake (July 25): Blister beetles reported as follows: On tomatoes at Madisonville and at Dixon on July 11; on cotton at Murray, and on roses and shrubs at Louisville on July 25, all localities in the western half of the State.

Tennessee. G. M. Bentley (July 23): On July 9 E. cinerea Forst. was found doing damage to Irish potatoes in Greenfield, Weakley County. Seventy-five percent of the foliage was destroyed.

Mississippi. C. Lyle (July 25): In southern Mississippi a heavy infestation of E. vittata reported on eggplants at Sumrall, while in Lauderdale County no injury to cultivated crops noted although beetles were abundant. Specimens of E. lemniscata F. sent from Hernando, northwestern corner of Mississippi, on June 23, and reported as stripping leaves from garden plants. Specimens of the latter beetle collected on soybeans on July 6 at Ruleville, Sunflower County, in the Delta.

Wisconsin. E. L. Chambers (July 23): Black blister beetles (E. pennsylvanica Deg.) doing serious injury to alfalfa, potatoes, and corn in spots all over the State, and especially abundant in the heavily infested grass-hopper areas.

Minnesota. A. G. Ruggles and assistants. (July 12): Blister beetles numerous in several parts of the truck-growing section of Hennepin County, south-eastern Minnesota.

Missouri. L. Haseman (July 23): Fewer complaints received during the month than usual, considering the continued abundance of grasshoppers.

North Dakota. J. A. Munro (July 22): Several species are very destructive to potato, caragana, and other plants. Most of the reports of serious injury have come from Valley City and Bismark vicinities, southeastern and south-central North Dakota, respectively.

South Dakota. H. C. Severin (July): Beginning to appear in large numbers and are causing considerable damage.

Nebraska. M. H. Swenk (July 23): Numerous complaints of blister beetles attacking garden crops, especially potatoes, received from over the State, particularly from the eastern half. The principal species are as follows: Macrobasis segmentata Say, M. unicolor Kby., M. immaculata Say, Epicauta lemniscata, E. cinerea Forst., and E. maculata Say.

Kansas. J. R. Horton (July 22): Very numerous and widespread in the Wichita area. Many complaints of severe damage to garden crops have come in. There are considerable flights to lights in the heart of the city.

H. R. Bryson (July 28): Particularly destructive to garden crops during the last month in western Kansas. Alfalfa also damaged, especially where plots grown for seed near Garden City.

Texas. R. K. Fletcher (July 22): E. vittata reported on tomatoes in Galveston County, southeastern Texas.

Utah. G. F. Knowlton (July 12): Reported as damaging alfalfa, beets, and several flower and garden plants in Tooele, Carbon, and Utah Counties.

A BEETLE (Strigoderma arboricola F.)

Maryland. E. N. Cory (July 15): This pest was found attacking vegetable and fruit crops at Denton, on the Eastern Shore.

CARROT BEETLE (Ligyrus gibbosus Deg.)

South Dakota. H. C. Severin (July): The carrot beetle is very abundant and doing much damage in gardens in eastern South Dakota.

CUCUMBER BEETLES (Diabrotica spp.)

Maryland. E. N. Cory (July 9): D. duodecimpunctata F. and D. vittata F. were found attacking squash at Severn, in Anne Arundel County.

South Carolina. J. G. Watts (July): Since July 3 specimens of D. balteata Lec. have been taken in a trap light at Blackville almost every night. Prior to that time no specimens had been taken since early April. No specimens observed in the field since early March.

Ohio. T. H. Parks (July 25): D. vittata was very abundant on melons and cucumbers during the first half of July, and was caught in large numbers in a light trap during June, but has greatly subsided at present.

Missouri. L. Haseman (July 23): In the vicinity of Columbia squash and cucumber plantings became severely infested by the striped cucumber beetle during the first half of July, and they are still abundant on unprotected plants.

Mississippi. C. Lyle (July 25): Reports of considerable injury by D. vittata to late plantings of melons from Meridian, in east-central Mississippi.

Nebraska. M. H. Swenk (July 23): From June 21 to July 20 reports received from Lancaster, Seward, Howard, and Franklin Counties, in the eastern half of the State, stated that cucurbit vines were being damaged by D. vittata.

Kansas. H. R. Bryson (July 28): D. vittata unusually abundant and destructive to melons, squash, and cucumbers at Manhattan and Bluff City, in the eastern half of the State.

Texas. R. K. Fletcher (July 22): D. duodecimpunctata and D. vittata reported on corn, tomatoes, and eggplants in Galveston County.

Utah. G. F. Knowlton (July 9): D. duodecimpunctata is very seriously damaging cucumbers and melons at Toquerville and Saint George, southwestern Utah.

Arizona. C. D. Lebert (July 23): Gourds over the entire Phoenix area are being riddled by cucumber beetles. Many plantings have had 30 percent of the foliage reduced.

TOBACCO THRIPS (Frankliniella fusca Hinds)

Florida. J. R. Watson (July 22): Considerable damage to peanuts on the station farm at Gainesville.

FALSE CHINCH BUG (Nysius ericae Schill.)

Utah. G. F. Knowlton (July 25): These bugs are doing unusual damage in several parts of the State.

NORTHERN MOLE CRICKET (Gryllotalpa hexadactyla Perty)

Texas. J. N. Roney (July 22): The mole cricket was reported on black-eyed peas, tomatoes, peppers, mustard, collards, and eggplant in Galveston County.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Maine. G. W. Simpson (July): Beetles are more numerous than they have been for several years. The larvae are doing considerable damage in fields not yet sprayed, at Presque Isle, northeastern Maine.

Connecticut. N. Turner (July 30): Damaged untreated fields of early potatoes, in southern part of the State.

Wisconsin. E. L. Chambers (July 23): After several years of comparative scarcity, reported in quite serious numbers throughout the State.

- North Dakota. J. A. Munro (July 22): Moderately abundant at Fargo on potatoes.
- Idaho. J. R. Douglass (July 25): Has been found on the western edge of the Twin Falls area and steps are being taken by the county and State officials to eradicate this insect from the large producing areas of south-central Idaho.
- Utah. G. F. Knowlton (July 13): Have been more abundant this year in the Ogden-Clinton areas of southern Weber and northern Davis Counties than last year. No spread of the restricted infestation has been noted.
- Oregon. H. P. Lanchester (July 4): Beetles are defoliating potato plants at Alicel, northeastern Oregon. Eggs, larvae, and adults were seen.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

- Massachusetts. A. I. Bourne (July 23): The summer brood of flea beetles has just begun to emerge. There is every indication that this brood will be fully as abundant as the spring brood.
- Connecticut. N. Turner (July 20): Adults are emerging about 2 weeks later than usual. Infestation is at least as heavy as usual on potatoes.
- North Dakota. J. A. Munro (July 22): Potato flea beetles abundant on potato plants at Fargo on July 6.
- Utah. G. F. Knowlton (July 18): These beetles are damaging potato foliage at Ogden and Logan, in north-central Utah.

POTATO TUBER WORM (Gnorinoschena operculella Zell.)

- Maryland. E. N. Cory (July 1): The tuber moth was found attacking potatoes at Princess Anne, Somerset County, on the Eastern Shore.

HORNWORMS (Protoparce spp.)

- Delaware. L. A. Stearns (July 18): Severe infestation of the tomato hornworm in 11-acre planting of tomatoes at Rising Sun, Kent County.
- Missouri. L. Haseman (July 23): From July 15 to 20 tomato hornworm moths were on the wing in great numbers in the vicinity of Columbia. The caterpillars were active on tomatoes and tobacco. We have had several complaints from tobacco growers.
- Nebraska. D. B. Whelan (July 23): Moths (P. sexta Johan.) were first caught at the light trap on the night of June 21.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

- New York. N. Y. State Coll. Agr. News Letter (July): Does not appear to be serious in any plantings observed in Dutchess County.

Virginia. H. G. Walker (July 26): Has been reported as being very abundant and injurious to beans at Suffolk, southeastern Virginia.

Ohio. N. F. Howard (July 12): More abundant than it has been for several years in the Columbus district, and migration continued well into July. Nymphs are becoming abundant on beans, but have not done serious damage.

Indiana. J. J. Davis (July 26): This pest is becoming very abundant.

Iowa. C. J. Drake (July 20): The potato leafhopper is very abundant in the vicinity of Ames, Des Moines, Clear Lake, and Cedar Rapids. Hopperburn becoming quite evident.

POTATO APHID (Illinoia solanifolii Ashm.)

Connecticut. N. Turner (July 20): Two fields of potatoes are heavily infested. In general the aphids are not abundant.

GREEN PEACH APHID (Myzus persicae Sulz.)

Nebraska. M. H. Swenk (July 23): Tomato plants have been considerably infested with the green peach aphid and other aphids. In eastern and central Nebraska, from Lancaster to Custer Counties, they reached the peak of abundance about June 25 to 28.

TOMATO PSYLLID (Paratrioza cockerelli Sulc.)

Nebraska. M. H. Swenk (July 23): Tomato and potato psyllid has built up an unusually heavy and threatening population in the irrigated sections of the North Platte Valley and in the dry land potato growing district of Box Butte, Sheridan, Dawes, and Sioux Counties, in western Nebraska. Damage to tomatoes reported from Custer County, in central Nebraska, on June 28, and at Lincoln on June 25 these insects were abundant, with eggs, nymphs, and adults present. The first ones were noted at Lincoln several days previously.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Connecticut. N. Turner (July 20): Serious damage has been done to garden beans in untreated fields in most sections of the State.

New York. N. Y. State Coll. Agr. News Letter (July): Is not causing much damage in eastern New York, but is doing some damage in western New York, and in Wayne, Monroe, and Orleans Counties, where it has not been destructively present in previous years.

Delaware. L. A. Stearns (July 18): Rather severe injury throughout bean acreage in Sussex County, in southern Delaware.

Virginia. A. M. Woodside (July 20): Abundant and injurious in the Staunton district.

H. G. Walker (July 26): Present in about its normal abundance at Norfolk.

South Carolina. J. N. Todd (July 26): Causing more than the usual amount of damage in the upper part of the State.

Georgia. O. I. Snapp (July 14): There was a heavy emergence from hibernation at Fort Valley and beetles have increased rapidly during the last 2 weeks.

C. H. Alden (July 21): Unsprayed beans are showing heavy infestations at Cornelia in the northern part of the State.

Florida. J. R. Watson (July 22): Sent in from Havana, Gadsden County, western Florida. This is the second locality from which it has been collected in Florida, previous collections being at Monticello, Jefferson County, although it was found last summer in Alabama within one-half mile of the Florida line.

Tennessee. G. M. Bentley (July 23): Heavy infestations were found in Davidson, Cheatham, Lauderdale, and Madison Counties.

Mississippi. C. Lyle (July 25): The beetle continues to be the most serious garden pest in Monroe County. In Lauderdale, Newton, and Jasper Counties heavy damage was caused to beans on July 22. All these counties are along the eastern border of the State.

Ohio. R. H. Nelson (July): First-generation adults began appearing in large numbers in many fields near South Point, south-central Ohio, the second week of July. Young beans were quite severely injured.

Indiana. J. J. Davis (July 26): Very abundant throughout the State. In the extreme southern end of the State eggs for the beginning of the third generation are being laid, and at La Fayette eggs for the second generation are being laid.

Kentucky. M. L. Didlake (July 25): Reported from the following scattered localities: Lexington on June 25, July 1 and 5; Worley and Belton on June 25; Louisville on June 28; Nicholasville and Larue on July 22.

Missouri. L. Haseman (July 23): A number of plantings of beans in gardens at Cape Girardeau, southeastern Missouri, reported as seriously attacked by this pest. (First record of damage from the State.)

Colorado. R. L. Wallis (July 21): All stages are abundant in commercial fields at Grand Valley, Mesa County, in west-central Colorado. Late-planted fields will escape severe injury.

Arizona. C. D. Lebert (July 20): Heavy infestations observed on small plots of beans in the East Verde River district, in central Arizona. As many as eight adults found on a single plant and several egg masses found. Damage quite severe.

Utah. G. F. Knowlton (July 12): The outbreak has been rather severe in central Utah.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Kentucky. M. L. Didlake (July 25): Abundant on beans at Lexington.

Missouri. L. Haseman (July 23): Repeated complaints received in July. The insect has been much more destructive to young beans than usual in the vicinity of Columbia.

Louisiana. L. O. Ellisor (July): The bean leaf beetle is damaging soybeans throughout most of the State.

BEAN APHID (Aphis rumicis L.)

California. R. E. Campbell (July 1): Following several weeks of cloudy weather the bean aphid developed in a number of lima bean fields along the coast near Oxnard, Ventura County, in southern California. At least 1,000 acres were infested.

PEAS

PEA APHID (Illinoia pisi Kltb.)

Maine. J. H. Hawkins (July 20): In central Maine the fungus which often checks aphids on peas has been an important factor in the natural control of aphids. The pea mosaic has done considerable damage in certain pea fields.

Connecticut. N. Turner (July 20): These aphids were not abundant on peas until after the pods were harvested.

New York. N. Y. State Coll. Agr. News Letter (July): Weather conditions were generally unfavorable to the development of the aphid, although in fields of late varieties the aphid population has reached large proportions and is inflicting considerable damage.

South Dakota. H. C. Severin (July): Abundant and doing considerable damage to garden and sweet peas.

PEA WEEVIL (Bruchus pisorum L.)

Indiana. J. J. Davis (July 26): During the last month the pea weevil was found infesting garden peas in several places in southern Indiana. First specimens sent in from Nashville on July 1 were larvae which had hatched only a few days before.

CABBAGE

IMPORTED CABBAGE WORM (Pieris rapae L.)

- New Hampshire. J. G. Conklin (July 26): Very numerous throughout the State.
- Connecticut. N. Turner (July 20): More abundant than usual on cabbage and cauliflower in Hartford County, 2 acres of young cabbage being killed in Southington.
- Pennsylvania. H. E. Hodgkiss (July 26): In very large numbers throughout the State.
- Indiana. J. J. Davis (July 26): Showed up in conspicuous numbers and, while little damage has occurred in central Indiana, their early appearance in noticeable numbers indicates a heavy infestation a little later.
- Missouri. L. Haseman (July 23): Rather abundant during the month but probably no more so than usual.
- North Dakota. J. A. Munro (July 22): Very abundant in various parts of the State.
- Idaho. J. R. Douglass (July 25): Very common on cabbage and turnips in the Twin Falls area, south-central Idaho.
- Utah. G. F. Knowlton (July 18): Cabbage plants are being injured at Ogden.

CABBAGE LOOPER (Autographa brassicae Riley)

- Indiana. J. J. Davis (July 26): Little damage so far, but the early appearance in conspicuous numbers in central Indiana indicates a heavy infestation later.

CABBAGE APHID (Brevicoryne brassicae L.)

- Pennsylvania. H. E. Hodgkiss (July 26): Cabbage aphid reported on July 18 as causing considerable damage, especially in the western half of the State.
- Utah. G. F. Knowlton (July 18): Cabbage plants are being injured by the cabbage aphid at Ogden.

HARLEQUIN BUG (Murgantia histrionica Hahn)

- Delaware. L. A. Stearns (July 21): An infestation is reported from Milford, Sussex County.
- Maryland. Gertrude Myers (July 25): Attacking cabbage on Avery Road, 3 miles east of Rockville, Montgomery County.
- Kentucky. M. L. Didlake (July 25): Reported from Gilpin, Casey County, eastern Kentucky, on July 22.

Tennessee. G. M. Bentley (June 26): Doing considerable damage to cabbage, mustard, and nasturtium in Crossville, Cumberland County.

Missouri. L. Haseman (July 23): Has been unusually scarce, as there have been only one or two complaints during July.

Oklahoma. F. A. Fenton (July 22): Reported from Cloud Chief, Washita County, in western Oklahoma.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Connecticut. N. Turner (July 20): There are very few squash bugs.

New York. N. Y. State Coll. Agr. News Letter (July): Very abundant on squash and pumpkin vines on Long Island, and is causing some damage in the western part of the State.

Maryland. E. N. Cory (July 9): Squash is being attacked at Severn, Anne Arundel County.

Missouri. L. Haseman (July 23): Unusually abundant in the vicinity of Columbia and has been depositing eggs in great numbers since July 10.

Nebraska. M. H. Swenk (July 23): Pumpkin and squash vines in Sarpy, Saunders, Lancaster, and Howard Counties, in eastern Nebraska, were attacked during the period from June 21 to July 20.

Kansas. H. R. Bryson (July 28): Very abundant. Injury reported during the month from Manhattan and Abilene, in eastern Kansas.

Oklahoma. F. A. Fenton (July 22): Found as follows in northeastern Oklahoma: At Claremore, Rogers County; at Pryor, Mayes County; and at Vinita, Craig County.

Texas. R. K. Fletcher (July 22): Reported as seriously injuring cantaloupe in Jones County, north-central Texas.

Idaho. J. R. Douglass (July 3): This insect has been found in Twin Falls County, south-central Idaho, and was first noted during the summer of 1937, but no report was made at that time. First record in this county.

Utah. G. F. Knowlton (July 3): Damaging squash at Farmington, Davis County.

SQUASH BORER (Melittia satyriniformis Hbn.)

Georgia. O. I. Snapp (July 14): Damaging summer squash at Fort Valley.

Nebraska. M. H. Swenk (July 23): Complaints of damage to squash vines received July 6 and 12 from Richardson and Holt Counties, in southeastern and north-central Nebraska, respectively.

MELONS

MELON WORMS (Diaphania spp.)

Georgia. O. I. Snapp (July 14): Pickle worms, D. nitidalis Stoll, and melon worms, D. hyalinata L. are abundant, damaging squash and cantaloups.

Mississippi. C. Lyle (July 25): Heavy infestations of D. nitidalis have been reported from Meridian, in east-central Mississippi, on squash and cucumbers.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

South Carolina. J. G. Watts (July 2): The population has been constantly on the increase since the middle of June in Barnwell County, in the southwestern part of the State. Considerable defoliation is being done especially to young fields. Infestation greater than that of the average year.

APHIDS (Aphidae)

Nebraska. D. B. Whelan (June 21): Aphids taken at Lincoln from asparagus as follows: Myzus persicae Sulz., Aphis gossypii Glov., and Illinoia solanifolii Ashm. No damage done. (Det. by P. W. Mason.)

EGGPLANT

EGGPLANT LACEBUG (Garraphia solani Heid.)

Mississippi. L. J. Goodgame (July 25): Several heavy infestations on eggplant in Monroe County, in the northeastern part of the State.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Massachusetts. A. I. Bourne (July 23): Heavy rains have done much to hold down the abundance of the onion thrips, and present indications point to a somewhat lighter infestation than last year.

Connecticut. N. Turner (July 20): Not so serious as last year in most places owing to heavy rains. One field in Hamden was seriously damaged.

Pennsylvania. H. E. Hodgkiss (July 26): Generally abundant throughout the State.

Virginia. H. G. Walker (July 26): Moderately abundant on onions at Norfolk late in May and early in June.

Ohio. N. F. Howard (July 9): A moderate infestation was present on a variety planting at Columbus. Varietal differences in susceptibility to attack are apparent.

Utah. G. F. Knowlton (July 23): There is moderate injury to onions in Davis and Utah Counties.

STRAWBERRY

STRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

Ohio. E. W. Mendenhall (July 14): This pest is abundant in some plantations in Licking County, north-central Ohio.

Minnesota. A. G. Ruggles and assistants (July): Abundant in every part of the State. Damage from 1 to 95 percent has been observed.

WHITE GRUBS (Phyllophaga sp.)

Indiana. J. J. Davis (July 26): Heavy infestation of white grubs in this year's planting in the important strawberry district of southern Indiana, in the vicinity of Borden and Pekin. The majority of the 1938 plantings appreciably infested, from 15 to 30 percent of the plants being killed.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

California. J. C. Elmore (July 8): Larvae found in pepper buds at Artesia, Los Angeles County, where 500 to 600 acres of peppers are being grown.

TOBACCO

POTATO TUBER WORM (Gnorimoschema operculella Zell.)

Florida. F. S. Chamberlin (July 18): Light splitworm infestations occurred in tobacco fields in Gadsden County. In one instance caused appreciable injury in shade-grown tobacco.

HORNWORMS (Protoparce spp.)

Connecticut. A. W. Morrill, Jr. (July 26): Hornworms (P. quinquemaculata Haw.) appeared in two shade tents in the Windsor district, in the Connecticut River Valley, doing considerable damage in one of them. They do not usually occur in shade tents or attack tobacco sufficiently to be of concern to the grower this early in the season.

Maryland. E. N. Cory (July 23): Heavy and continuous emergence of the tobacco hornworm appeared in the entire tobacco territory, on the Western Shore

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Connecticut. A. W. Morrill, Jr. (July 12): Ordinarily the second brood appears about July 1 and reaches a maximum about July 23. This year the infestation at the first of the season, when tobacco was set on June 1, was as severe as last year and more severe than normal. However, it was not until July 12 that the first individuals of the second brood could be found on a few tobacco plants and in some potato fields. (July 27): Emergence of the beetle in appreciable numbers occurred in a few shade tents, largely those covering sandy or light loam land, on July 26. The beetle has not appeared in anything like normal numbers.

TARNISHED PLANT BUG (Lygus pratensis L.)

Connecticut. A. W. Morrill, Jr. (July 5): There is a severe infestation on one side of a field in Collinsville, Hartford County. Plants had been attacked while the leaves were still in the bud and the leaves were badly misshapen. In general this insect has not done great damage.

GREENHOUSE WHITEFLY (Trialeurodes vaporariorum Westw.)

Florida. F. S. Chamberlin (July 12): Found in several fields of shade-grown tobacco in Gadsden County this season. In three shades the feeding of the insects and the accompanying sooty mold caused appreciable injury to the crop. Whiteflies were found in fields of sun-grown tobacco but the feeding caused no economic loss. Whiteflies have been collected on tobacco in this region in the past, but, previous to this season, no instances had been observed where the insects have caused damage of economic importance. (Det. by G. B. Morrill.)

CASTOR BEAN

SOUTHERN ARMYWORM (Prodenia eridania Cram.)

Florida. J. R. Watson (July 22): A commercial planting of castor beans in Manatee County, on the West coast, was seriously attacked by the semi-tropical armyworm.

Note: We are preparing a paper on the insects attacking the castor-bean plant wherever it grows. We are, therefore, making a special request that the workers examine plants for insects this summer and fall and send the findings to us. We should also appreciate any records you may have on hand.

COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy and C. F. Rainwater (July 2): In Florence County the first new weevils appeared on June 28. In 14 untreated plots the infestation averaged 7.7 percent. (July 16): In 16 untreated ~~chick plots~~ the infestation averaged 12 percent. (July 23): Weevils are increasing very fast and in many fields the infestation has reached 50 or 60 percent. The weevil situation in Florence County is more serious than for several years.

Georgia. P. M. Gilmor and P. A. Glick (July 10): In undusted Upland cotton in southern Georgia from 18 to 50 percent of the squares were punctured, and in Sea Island cotton that had been dusted the field average was 8 percent. (July 17): Many late fields of cotton have been seriously injured. Second brood is pupating. (July 24): Second-generation weevils began to appear on July 18 and by the 23rd were present in considerable numbers.

Florida. C. S. Rude and L. C. Fife (July 16): In 30 fields examined the infestation was increasing rapidly. Lake County showed no infestation in eight fields examined. In the northern counties the infestation ran from 12 to 92 percent. (July 30): In Alachua and Gilchrist Counties the square infestation ranges from 10 to 91 percent and in many fields the bolls are heavily infested. In Marion County the infestation is increasing and ranges from 10 to 91 percent. The only field in Lake County thus far found to be infested has 30 percent infestation.

Mississippi. R. L. McGarr, et al. (July 9): In Lowndes and Oktibbeha Counties an examination of more than 10,000 squares in 15 untreated fields showed an average infestation of 18 percent as compared with 12 percent for the previous week and 2 percent at this time last year. (July 23): An examination of 10,600 squares in 19 untreated fields showed an average infestation of 28.5 percent.

E. W. Dunnam and J. C. Clark (July 2): In Washington County infestation counts made on seven plantations showed that the percentage of infested squares varied from less than 1 percent to 70 percent, with an average of 29 percent infested. (July 30): On three plantations the average infestation was 49 percent.

Louisiana. R. C. Gaines, et al. (July 2): In Madison Parish 52,800 squares were examined from untreated cotton, of which 2,157 were punctured, or an average infestation of 4.1 percent. (July 30): The infested squares increased to an average of 36 percent in 19 untreated fields examined; the infestations ranged from 7 to 69 percent.

Arkansas. D. Isely (July 20): The boll weevil was quite generally distributed over the cotton-producing part of the State by early July, where it is more generally distributed than in any year on record except 1923 and 1932. Since then excessive dry weather has appeared to have checked its development in many counties.

Oklahoma. F. A. Fenton (July 22): The infestation continues to be threatening; however, a 2-week period of hot, dry weather in early July has apparently checked the infestation somewhat.

C. F. Stiles (July 22): Appearing in larger numbers in southeastern Oklahoma than they have in a number of years.

E. E. Ivy (July 25): Infestation in McCurtain County has increased steadily since early in May. Still somewhat spotted, some fields having from 50 to 60 percent of the squares punctured, others having less than 10 percent. Average probably near 25 or 30 percent at present.

Texas. R. W. Moreland and A. B. Beavers (July 2): In Brazos and Burleson Counties in untreated check plots in cotton fields the infestations in cotton squares ranged from 12 to 31 percent, averaging 19.5 percent. (July 30): In the untreated check plots the infestations ranged from 14 to 77 percent, with an average of 45 percent. In the treated plots it ranged from 2 to 31 percent, with an average of 12 percent. In the untreated upland fields it ranged from 14 to 78 percent, with an average of 47 percent.

K. P. Ewing, et al. (July 2): In Calhoun County 1,100 squares examined in 11 untreated check plots showed an average of 6.2 percent boll weevil punctured squares as compared with 3.2 percent last week. In Jackson County 17,600 squares were inspected in 11 fields which showed an average of 78 percent weevil punctured squares. (July 30): In Calhoun County the infestation was 3.6 percent. In Jackson County the infestation decreased to 12 percent.

A WEEVIL (Epicaerus formidolosus Boh.)

Florida. C. S. Rude (June 30): Has been very abundant in the cotton fields in the Gainesville area. Estimated to be about 1,000 per acre in experimental fields, but somewhat less abundant now. Found in exactly the same parts of the cotton plant as the boll weevil and constant care required while making weevil counts not to confuse the two insects. No damage found that could be directly connected with the insect. Not found on weeds or other crops when area bordering these fields was searched. (Det. by L. L. Buchanan.)

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman, et al. (July 2): The bloom-infestation records in the 12 fields in Presidio County were completed this week. The

results from the five records made in these fields showed the infestation to be extremely spotted. The infestation was unusually high in the fields in which there was no winter pasturage or other cultural practice that would tend to reduce the surface population. The fields that were near retired cotton acreage also showed some increase in infestation. During 1937 a group of 25 fields was selected and only 1 examination of 1,000 blooms in each field was made during the latter part of June. From the 25,000 blooms examined there were 843, or 3.37 percent, infested. In 1938 a group of 12 fields was selected and 5 records were made in these fields during the latter part of June. The total number of blooms examined was 16,901, averaging 1,408 per field, and 513, or 3.03 percent, were infested. (July 9): Boll infestation counts were made in one field in connection with the insecticide tests. There was an average of about one boll per plant at the time that the record was made. Eleven of the 100 bolls examined were found to be infested. Since these were the first bolls formed it is apparent that there will be considerable damage in this field by the close of the season. The field showed a high bloom infestation. The cultural practices in this field were favorable for a high survival as the stalks were not cut until late in the fall and were not plowed under until spring. (July 16): Bloom-infestation records were made in the lower El Paso Valley (Hudspeth County) on July 5-7. The fact that an infestation was found this early in the year would indicate that the worms had passed the winter in this area. (July 23): Bloom-infestation counts were made in the Balmorhea area during the week ending July 16 with negative results.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Mississippi. C. Lyle (July 25): First specimens found this year in Holmes County, central Mississippi, on July 16. Found in Oktibbeha County last week, and also an unconfirmed report from Sharkey County, in the Delta.

R. L. McGarr, et al. (July 20): One large leaf worm was found in Lowndes County, 12 miles east of State College.

E. W. Dunnam and J. C. Clark (July 25): Leaf worms on three plantations near Leland, in Washington County.

Louisiana. I. J. Becnel (July): Heavy infestations in Bossier Parish and also reported in Ouachita Parish, both in northern Louisiana.

R. C. Gaines, et al. (July 6): Larvae in all instars from first to sixth were found in one field near Delta Point, in Madison Parish. (July 8): Larvae found about 14 miles south of Tallulah, in Madison Parish. (July 23 and 30): Leaf worms have been found in practically all fields of succulent cotton but not in sufficient numbers to cause "ragging."

Arkansas. D. Isely (July 20): First record for 1938 received from Columbia County, southwestern Arkansas, on July 16.

Oklahoma. C. F. Stiles (July 22): First worms this year collected on July 16 in Garvin County, south-central Oklahoma, one of the earliest collections of this insect this far north in the State.

Texas. R. W. Moreland and A. B. Beavers (July 2): Several cotton leaf worms were collected during the week in Brazos and Burleson Counties. (July 16): Leaf worms were doing considerable "ragging" on some farms. Some dusting was done on a number of farms. (July 30): Some dusting being done for second generation.

K. P. Ewing et al. (July 2): Many fields in Calhoun County have been dusted during the week for leaf worm control. (July 9): Most of the leaf worms are now in the pupal stage. (July 16): A new generation has hatched in many fields and dusting is very general throughout Calhoun County. A heavy infestation has appeared in the Lavaca River bottom of Jackson County. The infestation is now as heavy as it was at its peak in 1936. (July 23): The new generation of leaf worms of last week is completely under control. (July 30): Leaf worms continue to hatch and control measures have been used in many fields in Calhoun County during the week.

A. J. Chapman et al. (July 9): Leaf worms were found near Presidio on July 7. This is, so far as we know, the earliest record of leaf worms in this area. The worms were full grown when found and had already folded up leaves in preparation for pupation. The moths must have reached here in June. This is apparently the **first** generation as only a few worms were found. (July 23): General infestation but not yet abundant enough to cause serious damage.

BOLLWORM (*Heliothis obsoleta* F.)

South Carolina. F. F. Bondy and C. F. Rainwater (July 16 and 30): A few found feeding in squares in Florence County.

Georgia. P. M. Gilmer and P. A. Glick (July 10): Near Tifton bollworms are in most fields in small numbers. (July 24): Appearing in some numbers, but no serious damage to date.

Florida. C. S. Rude and L. C. Fife (July 2): Not as numerous as a few weeks ago in Alachua and adjacent counties. (July 30): There are a few in almost all fields but in general they are causing little damage. In a few fields they are serious.

Mississippi. R. L. McGarr, et al. (July 16): Observed on cotton occasionally this week in Lowndes and Oktibbeha Counties.

E. W. Dunnan and J. C. Clark (July 2): A few noted on two plantations in Washington County.

Louisiana. I. J. Beemel (July): Damaging young cotton bolls in several northern parishes.

Oklahoma. E. E. Ivy (July 25): A few worms seen in cotton during the last week in McCurtain County, southeastern Oklahoma.

Texas. R. W. Moreland and A. B. Beavers (July 2): A few eggs noted on cotton in both upland and bottom fields in Brazos and Burleson Counties. (July 9): Ninety-one eggs were found in examining 2,000 cotton terminals in bottom fields. Eggs ranged from 0 to 19 per 100 terminals, with an average of 4.55 eggs per 100 terminals. In an upland field of succulent cotton 800 terminals were examined and 8 eggs found, or 1 egg per 100 terminals. (July 30): Injury is rather spotted. There are scattering fields where heavy injury has been caused. On 13 farms the injured blooms, bolls, and squares varied from 4 to 45 percent, with an average of 9 percent. The number of eggs varied from 0 to 16 per 100 terminal buds, averaging 2.4 per 100 buds.

K. P. Ewing, et al. (July 2): There are a few bollworms in the cotton in Calhoun County, apparently more than usual at this stage of fruiting of the cotton. (July 30): This insect is more widespread than ever in this area, and continues to cause serious damage in Calhoun and Jackson Counties.

A. J. Chapman, et al. (July 16): Bollworms are more numerous on cotton in Presidio County than at any time in recent years. The cloudy, rainy weather during the latter part of June and early part of July was favorable to this pest. (July 23): In some of the fields fully 60 percent of the crop has been destroyed. Bollworm damage has also been reported from El Paso and Pecos districts.

COTTON SQUARE BORER (Strymon melinus Hbn.)

Texas. R. K. Fletcher (July 22): More common than usual on cotton in the Brazos River bottoms of Burleson County, southeastern Texas. Injury not serious.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

South Carolina. F. F. Bondy and C. F. Rainwater (July 30): There are not many in the fields--no damage has been done.

Mississippi. R. L. McGarr, et al. (July 2): Examination of 7,500 terminal buds of cotton plants in 23 fields in Lowndes and Oktibbeha Counties showed an average of 6 cotton flea hoppers per 100 terminal buds (3.8 adults and 2.2 nymphs). (July 23): The average number of flea hoppers for 100 terminal buds was 4.2. With the exception of a very few fields the infestation has been of very little importance.

Louisiana. I. J. Beanel (July): Doing considerable damage in Bossier and Caddo Parishes, northwestern Louisiana, necessitating control measures.

Oklahoma. E. E. Ivy (July 25): Not very abundant this spring in McCurtain County. High infestations, 50 to 60 percent, in a few upland fields, adjacent to horsemint, but not continuing long. From 5 to 10 percent infestation in all fields now, but doing considerable damage, as many as 40 to 50 blasted squares commonly found in 100 tips examined.

Texas. R. W. Moreland and A. B. Beavers (July 2): In Brazos and Burleson Counties population light in most cotton fields. (July 30): Hopper population generally light but in some fields of young cotton the infestation is fairly heavy.

K. P. Ewing, et al. (July 2): In Calhoun County this week 7,700 terminal buds were inspected in 22 untreated check plots, showing an average of 12 adults and 56 nymphs, or a total of 68 flea hoppers per 100 buds. This is in comparison with 79 last week and 78 the week before. (July 30): These insects can be observed in many fields but very little damage is being done except in a few fields of late June planted cotton.

TARNISHED PLANT BUG (Lygus pratensis L.)

Mississippi. R. L. McGarr, et al. (July 16): In Lowndes and Oktibbeha Counties a few noted on cotton this week.

E. W. Dunnam and J. C. Clark (July 30): A few can be found in most fields but they have caused no noticeable damage.

Oklahoma. E. E. Ivy (July 25): A few minor infestations in McCurtain County, all of them in instances where alfalfa had been cut nearby.

Texas. R. W. Moreland and A. B. Beavers (July 2): A few found in all fields visited in Brazos and Burleson Counties.

RAPID PLANT BUG (Adelphocoris rapidus Say)

Mississippi. R. L. McGarr, et al. (July 16): A few noted on cotton this week in Lowndes and Oktibbeha Counties.

Texas. R. W. Moreland and A. B. Beavers (July 9): In Brazos and Burleson Counties more abundant in cotton than they have been for several years.

LEAF APHIDS (Aphididae)

South Carolina. F. F. Bondy and C. F. Rainwater (July 2): In Florence County leaf aphids have increased during the week, probably due to cool, cloudy weather. (July 30): Leaf aphids are few even in dusted cotton. Heavy rains have probably held them in check.

- Georgia. P. M. Gilmer and P. A. Glick (July 10): In Tift County quite heavy infestations are developing in all cotton, dusted or not. (July 24): The rather heavy infestation has almost disappeared.
- Florida. C. S. Rude and L. C. Fife (July 2): In Alachua and adjacent counties aphids are present in some fields although not numerous enough to cause damage. (July 30): Aphids are less numerous than a week ago. Even in fields that have been dusted they are not numerous.
- Mississippi. E. W. Dunnam and J. C. Clark (July 2): Few in most fields in Washington County. (July 30): The aphid population is building up on cotton that has been dusted four or five times.
- Louisiana. R. C. Gaines, et al. (July 30): Aphids are beginning to appear in Madison Parish where cotton has been poisoned several times.
- Oklahoma. E. E. Ivy (July 25): Fairly common at Idabel, McCurtain County, but not doing much damage except to caged cotton.
- Texas. R. W. Moreland and A. B. Beavers (July 30): Aphid infestation heavy in places.

K. P. Ewing (July 16): Where several applications of arsenicals have been made in Calhoun County, aphids are appearing in fairly large numbers. One field was observed where every leaf, square, bloom, boll, and even the stems of the plants were practically covered with aphids and with "honeydew."

- Arizona. W. A. Stevenson (July 2): Spotted infestations of aphids were still noted in several fields of cotton in the vicinity of Tucson. Predators were also noted in large numbers. (July 16): The aphid situation is still causing the cotton growers considerable concern.

COMMON RED SPIDER (Tetranychus telarius L.)

- South Carolina. J. G. Watts (July 15): A number of outbreaks in Barnwell County on cotton during early July, which was very dry. Subsequent rains have materially reduced the population.
- F. F. Bondy and C. F. Rainwater (July 30): Some fields have shown some damage. Infestations very local.
- Georgia. P. M. Gilmer and P. A. Glick (July 10): In Tift County isolated patches of cotton infested but no serious damage has been noted. (July 24): Rains have largely cleaned up red spider infestations.
- Mississippi. E. W. Dunnam and J. C. Clark (July 9): Few infestations noted in Bolivar County. (July 16): One infestation in Washington County.
- Arkansas. D. Isely (July 20): Serious injury occurring in some of the Delta counties, northeastern Arkansas.

F O R E S T A N D S H A D E - T R E E I N S E C T S

SATIN MOTH (Stilpnotia salicis L.)

New Hampshire and Vermont. J. V. Shaffner, Jr. (July 18): A few large Carolina poplar trees at White River Junction, eastern Vermont, infested. When examined on July 14, many larvae had died from wilt disease, but a sufficient number had completed development to produce a heavy deposit of eggs. A row of poplars across the river in West Lebanon, N. H., is also heavily infested.

Connecticut. S. S. Crossman (July 11): Large numbers of adults reported as gathered around electric lights in Torrington, Litchfield County, during the week ending on June 25. First record of flight this year.

F O R E S T T E N T C A T E R P I L L A R (Malacosoma disstria Hbn.)

New Hampshire. J. G. Conklin (July 26): While abundant in a few localities in the State, it is much less numerous than in 1937.

Vermont. J. V. Schaffner, Jr. (July): Many thousands of acres of sugar maple orchards and forests in Vermont are heavily infested, but the defoliation did not reach the complete stripping point except in a few small areas. Most of the larger infestations probably average 75 percent defoliated. Observations indicate that, in general, the infestations in Addison, Rutland, and Bennington Counties, western Vermont, are on the decline, but defoliation is more apparent in some sections of Windsor and Orange Counties, east-central Vermont, than in 1937. Many sugar orchards show the effects of the severe defoliations of the past 1 to 4 years, and in some localities many dead and dying trees have been cut.

Massachusetts. A. I. Bourne (July 23): Adults flying in large numbers during the first 10 days of July, particularly in the northern part of the Connecticut Valley. Swarms of moths caused considerable annoyance along the Mohawk Trail, particularly in Shelburne and Shelburne Falls.

New York. J. V. Schaffner, Jr. (July): Infestations are severe, particularly in Sullivan, Delaware, and Broome Counties, southern New York.

Ohio. E. W. Mendenhall (July 19): Found on elms at Columbus.

W E S T E R N T E N T C A T E R P I L L A R (Malacosoma pluvialis Dyar)

Washington. W. W. Baker (July 7): Larvae were causing serious damage in a loganberry field, an unusual occurrence. This species occurs on Vashon Island, in Tacoma and the Puget Sound areas, and is present in extremely large numbers each year, though not so abundant this year. Another species of Malacosoma was present in small numbers.

FALL WEBWORMS (Hyphantria spp.)

New York. E. P. Felt (July 22): H. textor Harr. has been somewhat generally abundant in southwestern New England and southeastern New York.

R. E. Horsey (July 15): Nest of H. cunea Drury found on Cotonaster acutifolia at Rochester, with the caterpillars $\frac{1}{4}$ inch or less in length.

WHITE-MARKED TUSSOCK MOTH (Hemerocampa leucostigma S. & A.)

Wisconsin. H. J. MacAloney (July 21): Found prevalent on several species of hardwoods, particularly basswoods and elm in Milwaukee. Heavy defoliation was reported in some places. On July 6 about 20 percent of the larvae had pupated.

GYPSY MOTH (Porthetria dispar L.)

Massachusetts. A. I. Bourne (July 23): Considerable injury reported in the Cape Cod section.

S. S. Crossman (July 11): Defoliation has begun to appear in sections of the western part of the State. Pupation is beginning to take place commonly in the severely infested areas.

Rhode Island. A. E. Stone (July 29): The heaviest infestation that the State has experienced since the early years of infestation is taking place.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Delaware. L. A. Stearns (July 14): Numerous on sycamores along highway in the vicinity of Milford, Sussex County, and generally abundant on evergreens in many localities.

Maryland. E. N. Cory (July 1): General infestation throughout the State.

Virginia. H. G. Walker (July 26): Several plantings of arborvitae at Norfolk have been reported as being moderately infested.

Georgia. T. L. Bissell (July 28): Numerous reports have been received of injury to arborvitae.

Tennessee. G. M. Bentley (July 23): Found July 1 and 7 on arborvitae, junipers and cedars in Davidson County, and a heavy infestation reported in a nursery in Cheatham County. Both counties are in western Tennessee.

Mississippi. C. Lyle (July 25): Specimens and complaints have been received from practically all sections of the State.

Ohio. T. H. Parks (July 25): More abundant than usual and is the subject of several calls daily.

Kentucky. M. L. Didlake (July 25): Reported on elm at Lexington on July 5; on evergreens at Louisville on July 6; in western Kentucky at Smithland on July 7; and at Williamsburg, in southeastern Kentucky, on July 15.

Illinois. W. P. Flint (July 23): Several reports have been received from the southern half of the State. No specimens or reports of injury received from central or north-central Illinois since the winter of 1935-36.

Texas. R. K. Fletcher (July 22): Some injury to arborvitae and cedar has been recorded in eastern Texas from Cherokee, Jefferson, Kaufman, Dallas, and Brazos Counties.

SCURFY SCALE (Chionaspis furfura Fitch)

Tennessee. G. M. Bentley (July 23): A few elm and maple trees in a nursery in Nashville, Davidson County, were found infested on July 1.

A MIDGE (Contarinia virginianae Felt)

Nebraska. M. H. Swenk (July 23): Reported from east-central Nebraska, Durt County, on July 27 as attacking chokecherry fruits.

LIME-TREE LOOPER (Erannis tiliaria Harr.)

Michigan. R. Hutson (July 25): The lime tree spanworm was common on pin cherry on July 14, about Cadillac, in the northern part of the Lower Peninsula.

ALDER

A SAWFLY (Henichroa washingtonia Rohw. & Midd.)

Washington. W. W. Baker (July 7): This insect caused complete defoliation of alder on Vashon Island and is about as abundant as usual.

ASH

BANDED ASH BORER (Neoclytus capraea Say)

Nebraska. M. H. Swenk (July 23): Ash trees were reported attacked in southeastern Nebraska, Fillmore County, on July 18.

A PSYLLID (Psyllopsis fraxinicola Foerst.)

Connecticut. E. P. Felt (July 22): Was sufficiently abundant to cause appreciable foliage disfiguration at Greenwich, Fairfield County.

AN APHID (Prociphilus fraxinifolii Riley)

Utah. G. F. Knowlton (July 12): Ash trees at Brigham, in the northwestern part of the State, have the apical growth seriously curled. A large number of the aphids are parasitized.

BIRCH

BRONZED BIRCH BORER (Agilus anxius Gory)

New York. E. P. Felt (July 22): Reported as seriously injurious in the outskirts of New York City.

Ohio. E. W. Mendenhall (July 18): This pest, attacking white birch, has found its way into Columbus. Dayton, Springfield, and Cleveland have been suffering from its presence for several years.

Iowa. C. J. Drake (July 20): Specimens attacking birch received from Des Moines Polk County, and Colfax, Jasper County.

CAMPHOR

AVOCADO RED MITE (Paratetranychus yothersi McG.)

Florida. J. R. Watson (July 22): Causing browning of camphor trees in the central part of Florida. This is considerably earlier than usual. It also occurs on avocados but camphor is preferred.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

New Hampshire. J. G. Conklin (July 26): Very abundant throughout the State this year, particularly in cities and towns where no control measures have been applied.

Massachusetts. A. I. Bourne (July 23): Usual amount of damage.

Rhode Island. A. E. Stone (July 29): Showing up more heavily in several sections of the State than in any recent year.

Connecticut. W. E. Britton (July 22): Infestations rather severe in the southern part of Litchfield County and the western part of Fairfield County.

New York. E. P. Felt (July 22): Has been prevalent here and there in southeastern New York in the Hudson River Valley north to Albany.

R. E. Horsey (July 20): Larvae seen feeding on June 24 at Rochester. Since then they have become very numerous on American, European, and Scotch elms. Large-sized larvae are still feeding in small numbers.

Pennsylvania. H. E. Hodgkiss (July 26): On June 21 local infestations in eastern counties were more severe than in 1937. Some larvae were almost mature, and others were in various stages of development.

E. J. Udine (July 11): Larvae are now migrating to the bases of the trees and pupating. All the Chinese elms around Carlisle are affected, the leaves being skeletonized.

Maryland. E. N. Cory (July 5): Reported on elm from Mechanicsville, Saint Marys County.

Virginia. A. M. Woodside (July 20): Fairly common in and around Staunton.

Ohio. E. W. Mendenhall (July 1): Quite bad in Columbus and has spread to every section of the city.

Utah. G. F. Knowlton and F. C. Harnston (July 30): Siberian elms at Smithfield and Hyrum are being seriously damaged by the elm leaf beetle. This is an unusual record for this State.

MOORNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

South Dakota (July): The caterpillars are unusually abundant in eastern South Dakota, and are doing much damage to elm and willow.

Nebraska. M. H. Swenk (July 23): In scattered localities throughout the State elm trees were being attacked late in June and early in July.

Utah. G. F. Knowlton (July 5): Larvae are damaging elm and willow foliage severely at Milford, in the southwestern part of the State.

ELM SAWFLY (Cimbex americana Leach)

Kansas. H. R. Bryson (July 28): Reported causing injury on native elm at Olathe, northeastern Kansas.

WOOLLY ELM APHID (Eriosoma americanum Riley)

Tennessee. G. M. Bentley (July 23): At Knoxville, Knox County, the leaves and tips of several American elms were highly infested on June 30.

Missouri. L. Haseman (July 23): Between July 15 and 20 in the vicinity of Columbia new growth on elm showed rather severe fresh infestation.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

New York. E. P. Felt (July 22): Reported from Yonkers at Westchester County, and Rhinebeck in Dutchess County.

Maryland. R. F. Burdette (July 11): Reported from Ashton, Montgomery County.

Michigan. R. Hutson (July 25): Reported from Midland, Midland County, in the center of the Lower Peninsula, on July 3.

Nebraska. M. H. Swenk (July 23): Report received from Keith County, southwestern Nebraska, of this scale attacking elm trees.

FIR

SPRUCE BUDWORM (Cacoecia fumiferana Clem.)

Minnesota. R. H. Nagel (July 21): This insect is common on the Minnesota-Ontario border. About 10 square miles of jack pine on the Cut Foot Six Ranger District, Chippewa National Forest, is heavily infested.

Wyoming. D. DeLeon (July 25): Extensive defoliation of Douglas fir is taking place at Sheep Mountain in the Centennial district.

Colorado. J. A. Deal and D. DeLeon (July 25): Infestation on Douglas and white firs in the following localities: West Creek; Pike National Forest, Platte River's South Fork; La Veta Pass, San Isabel National Forest; and Ouray. Extensive defoliation occurring.

LOCUST

SILVER-SPOTTED SKIPPER (Epargyreus tityrus F.)

Kentucky. M. L. Didlake (July 25): Reported injuring young locust trees at Guston, Meade County, on July 6.

LOCUST BORER (Cyllene robiniae Forst.)

Tennessee. G. M. Bentley (July 23): Several locust trees on June 11 were highly infested with the young of this insect at Johnson City, Washington County.

LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

Kentucky. M. L. Didlake (July 25): Very abundant at Covington, Kenton County, on July 20.

MAPLE

GREEN-STRIPED MAPLE WORM (Anisota rubicunda F.)

Kansas. H. R. Bryson (July 23): Reported as defoliating maple trees near Valley Falls and Oskaloosa, northeastern Kansas.

WOOLLY ALDER APHID (Prociphilus tessellatus Fitch)

Connecticut and New York. E. P. Felt (July 22): Found curling the foliage of cutleaf maples near Hartford and at Accord, Ulster County, eastern New York.

TERRAPIN SCALE (Lecanium nigrofasciatum Perg.)

Michigan. E. I. McDaniel (July 22): Hatching and quantities of it infesting soft maple at Fenton, Genesee County, in southeastern Michigan.

A SCALE INSECT (Aspidiotus comstocki Johns.)

South Carolina. J. A. Berly (June 30): On leaves of Norway maple at Greenville
on June 22. (Det. by H. Morrison.)

MAPLE BLADDER GALL (Phyllocoptes quadripes Shim.)

Maryland. E. N. Cory (July 1): Reported as generally infesting maples in the
State.

COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Pennsylvania. H. E. Hodgkiss (July 26): Specimens sent from near Pittsburgh.
Reported on July 21 as being abundant on soft maples.

Indiana. J. J. Davis (July 26): Has been the subject of numerous reports from
northern Indiana and a few from the southern part.

OAK

TWIG PRUNER (Hypernallus villosus F.)

Michigan. R. Hutson (July 25): Reported from Milford, Oakland County, in south-
eastern Michigan, on July 16.

TWIG GIRDLER (Oncideres cingulatus Say)

Iowa. C. J. Drake (July 20): Specimens have been received from Des Moines and
Cedar Rapids.

A LEAF ROLLER (Argyrotoxa semipurpurana Kearf.)

New Jersey. C. W. Collins (June 22): Larvae were responsible for partial de-
foliation of pin oaks in southern Morris, northern Somerset, and western
Union Counties, all in north-central New Jersey, where the infestation was
rather general during May. Frequent instances of almost complete de-
foliation were noted. (Det. by A. Busck.)

A LEAF MINER (Lithocolletes hamadryella Clem.)

New York. E. P. Felt (July 22): Reported as extremely abundant on western Long
Island.

OBSCURE SCALE (Chrysomphalus obscurus Comst.)

Mississippi. C. Lyle (July 25): Report of several oaks in Lauderdale County, in
the eastern part of the State, having been injured.

A GALL INSECT (Neuroterus umbilicatus Bass.)

New York. R. E. Horsey (July): Found in considerable numbers on the under sides
of swamp white oak leaves, especially near the tips of the branches, on
July 14 at Rochester.

PINE

A CHRYSOMELID (Colaspis pini Barber)

Mississippi and Louisiana. T. E. Snyder (July 24): Pine needles being browned and trees believed to be dying from the effects of feeding at Covington and Slidell, St. Tammany Parish, La., and at Gulfport, Miss.

SAWFLIES (Neodiprion spp.)

Vermont. J. V. Schaffner, Jr. (July 18): Larvae of Neodiprion sp. sent to the laboratory with a report that they were taken on red pines in Rutland County. The infested plantation is about 20 years old and about 1 acre has been severely defoliated. This is the species which has been prevalent in eastern Massachusetts the last 3 years.

Connecticut. E. P. Felt (July 22): N. pinetum Nort. is quite prevalent on a small planting of pine at Danbury.

Ohio. T. H. Parks (July 25): Larvae of N. abbotti Leach were received on July 20 from Knox County, in north-central Ohio, with the statement that they had caused serious injury to white pine.

Michigan. R. Hutson (July 25): N. pinetum was reported on white pine at Grosse Pointe, Wayne County, and at Grand Rapids, Kent County.

A SAWFLY (Neodiprion sertifer Geoffr.)

Michigan. E. I. McDaniel (July 12): Received on Norway pine from Grayling, northern Lower Peninsula. The sawflies were attacking the mature growth of the pines. (Det. R. A. Cushman.)

LODGEPOLE NEEDLE MINER (Recurvaria milleri Busck)

California. J. E. Patterson (July 13): Specimens have been taken from pinon pine in the Inyo National Forest. (Det. A. Busck.)

A MOTH (Pinipestes zimmermanni Grote)

Wisconsin. H. A. MacAloney (July 21): In a 12-year-old mixed stand of Scotch and jack pine at White Fish Bay, Milwaukee County, the former is heavily infested, whereas the latter species is only slightly infested. When the trees were examined on July 7 the larvae were nearly full grown.

A SCALE INSECT (Matsucoccus matsumurae Kuw.)

Massachusetts. A. I. Bourne (July 23): An infested twig of pitch pine, Pinus rigida, was received from Lexington. The extent of the infestation was not reported.

POPLAR

POPLAR TENTMAKER (Ichthyura inclusa Hbn.)

Ohio. T. H. Parks (July 25): This pest has injured poplars in Morgan County, southeastern Ohio. Specimens received on July 9.

E. W. Mendenhall. (July 14): Is doing some damage to poplars in nurseries in Licking County, north-central Ohio.

A LEAF BEETLE (Chrysomela tremulae F.)

Minnesota. H. J. MacAloney (July 21): This beetle is fairly common on aspen all over the Superior National Forest. Eggs and young larvae were also found on July 18.

COTTONWOOD LEAF BEETLE (Chrysomela scripta F.)

Nebraska. M. H. Swenk (July 23): Sent in on June 27 from Butler County, in eastern Nebraska, with the report that this species, together with the goldsmith-beetle (Cotalpa lanigera L.), was defoliating cottonwood trees.

NEVADA BUCK MOTH (Hemileuca nevadensis Stretch)

Nebraska. D. D. Whelan (July 26): Caterpillars were feeding on cottonwood leaves in Logan and Custer Counties, in central Nebraska, early in July.

SPRUCE

EUROPEAN SPRUCE SAWFLY (Diprion polytomum Htg.)

New Hampshire and Vermont. J. V. Schaffner, Jr. (July 18): Areas around Lincoln, western Vermont, and Wilmington, eastern Vermont, and Dublin and Temple, in southwestern New Hampshire, which were found heavily infested in 1937, are again heavily infested. Cocoons of the first generation were found commonly on July 3.

A SAWFLY (Pikonema alaskensis Rohw.)

Minnesota. H. J. MacAloney (July 21): Throughout northern Minnesota the yellow-headed spruce sawfly is common. Individual small trees here and there have nearly all of the 1938 needles eaten, but over the region as a whole the damage is slight.

AN APHID (Chermes lariciatus Patch)

Michigan. R. Hutson (July 25): Found on white spruce at Manistique, Schoolcraft County, Upper Peninsula, on June 30.

SPRUCE MITE (Paratetranychus uniunguis Jacobi)

Massachusetts. A. I. Dourne (July 23): Mite injury on spruce has been quite common in the State.

Connecticut. M. P. Zappe (July 23): Mites are more abundant on evergreens in nurseries than for several years.

Michigan. R. Hutson (July 25): Reported from Farmington, Saint Johns, East Lansing, Kalamazoo, Battle Creek, Detroit, and Jackson.

SUMAC

A CATERPILLAR (Datana perspicua G. & R.)

Nebraska. M. H. Swenk (July 23): Report of this insect defoliating ornamental sumac on July 9.

SYCAMORE

A RED SPIDER (Tetranychus sp.)

Florida. J. R. Watson (July 22): Sycamore leaves received from Polk County, in central Florida, heavily infested, with the statement that all the sycamore trees in that section were very much browned. Species not determined.

WALNUT

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Tennessee. G. M. Bentley (July 23): On June 31 a few walnut trees near Lebanon, in Wilson County, were infested.

Ohio. T. H. Parks (July 25): The walnut datana is now feeding on walnut and hickory throughout central Ohio.

Michigan. R. Hutson (July 25): Reported at Marcellus, southwestern Michigan, on July 3.

Illinois. W. P. Flint (July 23): The first brood of caterpillars is very abundant. The moths have been taken in larger numbers than for 5 years during which records have been kept.

Missouri. L. Haseman (July 23): During the first 2 weeks of July colonies of the caterpillar were very abundant throughout the State, and, where no efforts to control were made, they stripped a great many of the walnut and some hickory trees. By July 20 practically all of the caterpillars were mature. In breeding cages many had pupated by July 15. Maturing this early, there is likely to be another generation.

Nebraska. M. H. Swenk (July 23): Report of walnut trees being attacked received from Douglas County, on the eastern border, on July 19.

Kansas. H. R. Bryson (July 26): Reported defoliating walnut trees at Shawnee, northeastern Kansas. Observed at Manhattan but not destructive.

WILLOW

BEETLES (Coleoptera)

Massachusetts. A. I. Bourne (July 23): Willows continue to show the effects of the willow flea weevil (Orchestes rufipes Lec.) and the willow leaf beetle. Wet weather has done much to keep the trees in good condition so that they do not show quite the amount of damage they otherwise might.

INSECTS AFFECTING GREENHOUSE

AND ORNAMENTAL PLANTS

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana Walk.)

Ohio. E. W. Mendenhall (July 19): Found in abundance on spirea stock in a nursery at Columbus.

A SPHINX MOTH (Sphecodina abbottii Swains.)

Vermont. H. L. Bailey (July 27): More plentiful than usual in Washington County, central Vermont, though not in outbreak numbers. Specimens of nearly full-grown larvae received from various points, largely on woodbine, from July 13 to 25.

A WEBWORM (Crambus sp.)

Pennsylvania. H. E. Hodgkiss (July 26): Adults were plentiful on golf greens in the Philadelphia area on July 7.

FLEA BEETLES (Halticinae)

Florida. J. R. Watson (July 22): Blepharida rhois Fors. defoliated some Brazilian pepper trees at Sarasota, on the southern Gulf coast. Altica ignita Ill. was sent in from Pinellas County, on the Gulf, where it was reported as severely damaging crapemyrtle and azaleas.

HAIRY CHINCH BUG (Blissus hirtus Montd.)

Connecticut. E. P. Felt (July 22): Causing some injury to lawns in southwestern Connecticut in spite of numerous rains. The damage is considerably less than last year.

Rhode Island. A. E. Stone (July 29): Hairy chinch bug reported from two or three places in the State.

New York. E. P. Felt (July 22): Reported from Dedford and Port Chester, in Westchester County.

Pennsylvania. H. E. Hodgkiss (July 26): The infestation is heavy on uncut golf greens in the Philadelphia area. Few adults were present, but all stages of nymphs were found on June 21.

WHITE PEACH SCALE (Aulacaspis pentagona Targ.)

Virginia. H. G. Walker (July 26): Very abundant and reported as seriously injuring a wide variety of trees and shrubs in and near Norfolk.

South Carolina. J. A. Berly (July 26): Heavy infestation on mulberry at Fair Forest, Spartanburg County.

Texas. R. K. Fletcher (July 22): Very seriously injured Amur privet in Harris County. Also recorded on privet and French mulberry in Galveston County. Both counties are in southeastern Texas.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Georgia. T. L. Bissell (July 15): Collected on Pittosporum tobira in Amsterdam and reported from Americus, southwestern Georgia.

Louisiana. D. A. Osterberger (July): Found on nandina, boxwood, and pittosporum around Baton Rouge.

BARBERRY

A CATERPILLAR (Omphalocera dentosa Grote)

Nebraska. M. H. Swenk (July 23): Specimens taken from a barberry bush in Stanton County, eastern Nebraska, on June 25.

CHRYSANTHEMUM

CHRYSANTHEMUM GALL MIDGE (Diarthronomyia hypogaea Loew)

Ohio. E. W. Mendenhall (July 21): Quite bad on chrysanthemum in greenhouses at Barnesville, southeastern Ohio.

THRIPS (Thysanoptera)

Maryland. E. N. Cory (July 11): Attacking chrysanthemum at Rockville, Montgomery County.

Ohio. E. W. Mendenhall (July 21): The greenhouse thrips (Heliothrips haemorrhoidalis Bouche) is quite severe on chrysanthemum in greenhouses in Barnesville.

COLUMBINE

COLUMBINE BORER (Papaipema purpurifascia G. & R.)

Massachusetts. A. I. Bourne (July 23): Several complaints of the activities of this borer from various sections of the State.

A WEEVIL (Conotrachelus anaglypticus Say)

Maryland. C. A. Weigel & F. F. Smith (July): Found at Beltsville infesting roots and crowns of columbine, causing a wilting, yellowing, and ultimate death of plants by severing the growth at the crowns and near the leaf base.

DOGWOOD

ROUNDHEADED APPLE TREE BORER (Saperda candida F.)

North Carolina. D. L. Wray (July 12): Doing extensive damage to dogwood trees in nurseries and in the woods in the vicinity of Asheville. It is quite serious to budded pink dogwood. The larvae have killed limbs from 1 to 2 feet in length. A slight discoloration of the foliage is the first sign of the damaged twigs. In some places an armful of twigs containing larvae could be collected.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

Maryland. E. N. Cory (July 5): Reported as general in the State.

Virginia. H. G. Walker (July 26): Present in the Norfolk district in about its usual abundance.

Tennessee. G. M. Bentley (July 23): Badly infesting Euonymus japonica at Memphis, Shelby County, and Nashville, Davidson County, as reported on June 21.

Texas. R. K. Fletcher (July 22): Heavily infested leaves and stem of a shrub from Harrison County, northeastern Texas.

GLADIOLUS

THRIPS (Thysanoptera)

Indiana. J. J. Davis (July 26): Gladiolus thrips (Taeniothrips simplex Morison) exceptionally abundant and destructive throughout the State.

Kentucky. M. L. Didlake (July 25): Reported at Lexington on July 11.

Washington. H. P. Lanchester (July 15): Onion thrips (Thrips tabaci Lind.), probably from adjacent onion fields being harvested, swept over gladiolus plantings at Walla Walla and ruined flower spikes. They left in a few days Gladiolus thrips were present, but in very limited numbers.

HONEYSUCKLE

A SAWFLY (Abia inflata Nort.)

Illinois. C. L. Metcalf (June 11): Reported as having ruined a lot of honeysuckle shrubbery in northwestern Illinois.

JUNIPER AND CEDAR

JUNIPER SCALE (Diaspis carueli Targ-Tozz.)

New Jersey. C. H. Hadley (July 25): Many complaints from residents of Moorestown and vicinity, Burlington County, of injury to ornamental junipers.

Oregon. D. C. Mote (July): Normal infestation in the Willamette Valley, western Oregon. Crawling young settled down by July 1.

JUNIPER WEBWORM (Dichomeris marginellus F.)

Ohio. E. W. Mendenhall (July 15): Caterpillars were found infesting junipers slightly at Pataskala, south-central Ohio.

MAGNOLIA

MAGNOLIA SCALE (Neolecanium cornuparvum Thro)

New York. R. E. Horsey (July): Exceptionally numerous on Magnolia acuminata on July 5 at Rochester. Autos parked under one tree became sticky with exudations like fine rain.

PALM

PALM LEAF SKELETONIZER (Homoledra sabalella Chamb.)

Alabama. R. W. Dawson (June 6): This insect received from Mobile. (Det. by C. Heinrich.)

ROSE

ROSE CURCULIO (Rhynchites bicolor F.)

Nebraska. D. B. Whelan (July 26): Present on wild roses in eastern Nebraska during early July, and also reported as doing considerable damage in an ornamental rose garden in Lincoln, Lancaster County, on July 12.

ROSE SAWFLY (Caliroa aethiops F.)

Nebraska. M. H. Swenk (July 23): This rose slug was reported in Harlan County, south-central part of the State, on June 26.

ROSE SCALE (Aulacaspis rosae Bouche)

Ohio. E. W. Mendenhall (July 22): The scale is found quite bad in places where roses are grown in central Ohio.

WATERLILY

A FULGORID (Megamelus davisii Van D.)

North Carolina. C. S. Brinley (July 18): These fulgorids have persisted since 1934 and thoroughly spoil the blooming of waterlilies at Raleigh. Possibly some of this may be due to the presence of a species of thrips, first detected this year on the under side of the leaves in hundreds. The fulgorids occur all season and are difficult to control.

YEW

BLACK VINE WEEVIL (Brachyrhinus sulcatus F.)

Massachusetts. E. P. Felt (July 22): Reported as injuring yew in the Boston area.

A MEALYBUG (Pseudococcus cuspidata Rau.)

Ohio. J. S. Houser (June 27): Mealybugs sent from Canton, east-central Ohio. They are infesting Japanese yew. (Det. by H. Morrison.)

CORRECTION

Note: Please change the generic name Eucosma to Suliema, on Page 306, line 5 under Sunflower, Insect Pest Survey Bulletin, Vol. 18, No. 5, July 1, 1938.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MOSQUITOES (Culicinae)

Delaware. L. A. Stearns (July): Peak flight of Aedes sollicitans Walk. at Lewes Sussex County, from July 10-13.

Georgia. A. L. Brody (July): Culex pipiens L., quite annoying in houses at Valdosta, south-central Georgia, since the middle of June.

Florida. S. E. Shields. (July 13): Mosquitoes, particularly A. sollicitans and A. taeniorhynchus Wied., quite bad at Fort Pierce now. Reported more abundant in other places, especially from Vero Beach and Palm Beach.

W. V. King. (July 22): More or less severe outbreaks of mosquitoes during July and late June in nearly all areas along the Atlantic coast, as well as in some sections of the Gulf coast. The species principally involved has been the salt-marsh mosquito, A. taeniorhynchus, although large numbers of the freshwater breeder, Psorophora columbiae D. & K., has also appeared in some sections.

Mississippi. E. E. Rogers (July 19): Considerable numbers of Anopheles quadrimaculatus Say and C. pipiens reported at Sylvaena, just south of central Mississippi.

Indiana. J. J. Davis (July 26): Mosquitoes exceptionally abundant throughout the State.

Missouri. L. Haseman (July 23): Two or three species of common mosquitoes very abundant and annoying throughout central Missouri.

EYE GNATS (Hippelates sp.)

Georgia. A. L. Brody (July 19): Extraordinarily abundant during the past month at Valdosta, an average of about five per person being noticed indoors in screened houses. Average considerably higher outdoors, especially in the woods.

MIDGES (Chironomus spp.)

New York. G. H. Bradley (July 13-15): A large outbreak of gnats which are breeding in enormous numbers in semiartificial lakes and lagoons on the site of the New York World Fair. So abundant and troublesome as to cause a serious menace to the success of the Fair unless controlled.

FEATHER MITE (Liponyssus sylviarum C. & F.)

New York. Mrs. C. R. Marshal (May 26): Mites collected on window sill at Ardsley, Westchester County. Mites very abundant. (Det. by H. E. Ewing.)

A SPRINGTAIL (Sira sp.)

Illinois. C. L. Metcalf (June 11): Specimens, probably S. platani Nicolet, submitted from northeastern Illinois with the statement that they were swarming over window sills and into a room where old papers and magazines were stored. (Det. by A. B. Gurney.)

CHIGGER (Trombicula irritans Riley)

Delaware. L. A. Stearns (July 18): Complaints received from Fenwick Island.

Ohio. N. F. Howard (July 2-24): Continuing abundant and annoying despite frequent showers and rather high relative humidity.

Missouri. L. Haseman (July 23): Seemingly very abundant and active, judging by complaints from all over the State.

Iowa. C. J. Drake (July 20): Reported as very abundant in a number of southern Iowa counties and in the eastern part of the State, along the Mississippi River. Very heavy infestations reported at Dubuque and Burlington.

South Dakota. H. C. Severin (July): Abundant along the Missouri River bottoms, in the southeastern part of South Dakota.

Nebraska. M. H. Swenk (July 23): Many complaints of annoyance by chiggers infesting lawns received from Douglas and Lancaster Counties, in eastern Nebraska, during the period from June 21 to July 20.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

Georgia. A. L. Brody (July 19): Infestations increased considerably in the vicinity of Valdosta during the last month. Twenty-nine egg masses and 3 infestations observed from June 22 to July 19 on artificially wounded animals. An infestation in a steer, predisposed by the Gulf coast tick, also observed. At the Valdosta laboratory infested animals received four egg masses during the week ending on July 9. A case in a heifer was reported on July 1, as well as another in a cow on July 6. Three screwworm cases reported in Savannah on July 8. Other complaints numerous.

STABLEFLY (Stomoxys calcitrans L.)

Missouri. L. Haseman (July 23): Abundant and unusually annoying to man as well as livestock just ahead of recent rains.

Nebraska. M. H. Swenk (July 23): Inquiries as to the control received during the period from June 21 to July 20 from Washington, Pawnee, Saline, Doone, and Kearney Counties, in the eastern half of the State.

HORN FLY (Haematobia irritans L.)

Missouri. L. Haseman (July 23): Continuing in about normal abundance.

North Dakota. J. A. Munro (July 22): Very abundant and generally distributed over a large part of the State.

LONE STAR TICK (Amblyomma americanum L.)

New Jersey. G. H. Bradley and W. A. Connell (July 24): Collected from man near May's Landing, Atlantic County, southeastern New Jersey. Apparently the first record of the occurrence of this tick in New Jersey, and probably the farthest north it has been taken.

GREENBOTTLE FLY (Lucilia sp.)

Georgia. A. L. Brody (July 19): Seven wound infestations reported during the last month in the vicinity of Valdosta.

HORSE

HORSEFLIES (Tabanidae)

Texas. W. G. Bruce (July 10): Specimens of tabanids taken in four cattle fly traps in the Dallas district during the last 2 weeks as follows: Tabanus lineola var. scutellaris Walk., 97; T. lineola F., 23; T. sulcifrons Macq., 11; T. benedictus Whit., 10; Silvius quadrivittatus Say, 8; Chrysops callidus C. S., 1; and C. flavidus Wied., 2.

BOTFLIES (Gastrophilus spp.)

Washington. C. F. Bishopp and M. P. Jones. Three horses on a farm near Pullman, eastern Washington, found to be infested with about 10, 40, and 150 eggs, respectively, of the throat bot, G. nasalis L. One group of about six of these eggs was on the fore leg. Some reactions noted among horses on one farm, indicating throat bot attack.

California. F. C. Bishopp and A. W. Lindquist (July 17): Two horses in the vicinity of Upper Lake, northern California, showed five or six eggs of the throat bot, G. nasalis, on one. There were no G. intestinalis Deg. eggs.

BLACKFLIES (Simulium spp.)

Nebraska. M. H. Swenk (July 23): Inquiries as to control of Simulium flies received from Adams, eastern Nebraska, and Box Butte, western Nebraska, Counties. The former on July 9 referred to S. vittatum Zett., attacking horses, while the latter on July 11 was of Simulium sp. flies bothering a dog.

MISCELLANEOUS ANIMALS

A TICK (Dermacentor sp.)

Delaware. L. A. Stearns (July 14): Heavy infestation on dogs at Glasgow, in Newcastle County.

BITING CAT LOUSE (Bovicola subrostratus Nitz.)

Nebraska. M. H. Swenk (July 23): Infestation on a cat reported from Antelope County, northeastern Nebraska, on July 1.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

Node Island. A. E. Stene (July 29): Found in large numbers in a South Kingstown house.

Pennsylvania. H. E. Hodgkiss (July 26): Causing serious damage to buildings in different parts of the State.

Iowa. C. J. Drake (July 20): Doing damage to houses in Iowa City, Johnson County, eastern Iowa.

Nebraska. M. H. Swenk (July 23): Inquiries concerning termites (R. tibialis Banks) received from June 21 to July 20 from Lancaster and Furnas Counties, several from the latter county relative to this pest attacking living trees.

Oklahoma. F. A. Fenton (July 22): Termites (R. flavipes Koll.) reported from several localities, scattered throughout the State.

Texas. R. K. Fletcher (July 22): Severely injured Japanese euonymus, wax leaf ligustrum, and photinia in a nursery at Fort Worth, Tarrant County.

ANTS (Formicidae)

Massachusetts. A. I. Bourne (July 23): Ants have been the subject of an unusually large number of complaints, both indoors and in lawns.

Connecticut. N. Turner (July 20): The usual number of infestations of Camponotus herculeanus pennsylvanicus Deg. on porches.

New York. R. E. Horsey (July): The black carpenter ant (C. herculeanus pennsylvanicus) found in an old frame house in Rochester.

Maryland. E. N. Cory (July 9): The pavement ant, Tetramorium caespitum L., reported as being generally present in the State.

Mississippi. C. Lyle (July 25): On July 16 specimens received of the Argentine ant, Iridomyrmex humilis Mayr, for the first time from Pheba, in Clay County. Judging from letters from correspondents in infested towns over the State, these ants are very abundant in places where no campaigns were conducted last year. On June 28 specimens received of Iridomyrmex pruinosus var. analis Andre from Greenville, Washington County, in the Delta. Specimens of Solenopsis xyloni McCook recently sent from Tupelo, in the northern part of the State.

Nebraska. M. H. Swenk (July 23): Many inquiries on the control of ants received from Lancaster and Adams Counties during the period from June 21 to July 20. Infestations reported from Johnson and Douglas Counties on June 28 and July 5, respectively, of the big black carpenter ant (C. herculeanus pennsylvanicus) in a pantry and in cellar steps. Specimens of Crematogaster lineolata Say were received from Nemaha County on July 12, with the report that they had been found in a porch of a house where water had caused the wood to rot.

Kansas. H. H. Walkden (July 7): The thief ant (Solenopsis molesta Say) was found injuring kafir seed in one field near Manhattan, northeastern Kansas. Damage necessitated replanting a portion of the field.

Oklahoma. C. F. Stiles (July 22): The harvester ant (Pogonomyrmex barbatus F. Smith) apparently increasing throughout the western half of the State, and they are so numerous at Frederick that an eradication campaign is now under way.

F. A. Fenton (July 22): Monomorium pharaonis L. reported at Carnegie, Caddo County, in western Oklahoma, and the red harvester ant, P. barbatus reported from the following localities: Frederick, Tillman County, and Geary, Blaine County, in western Oklahoma.

Utah. G. F. Knowlton (July 22): Annoying in many homes and gardens in Cache, Salt Lake, and Utah Counties this spring.

INDIAN-MEAL MOTH (Plodia interpunctella Hbn.)

California. P. Simmons (June 12): Dry fruits of the evergreen fig (Ficus macrophylla) stored in the laboratory, at Fresno, produced 14 Indian-meal moths between the time of collection (November 1937) and June 12, 1938. The fruits were collected at Santa Barbara. Infestation may have occurred in the laboratory. One parasite, Idechthis canescens Grav., emerged in the same container. (Det. by C. Heinrich and R. A. Cushman.)

DRUG STORE BEETLE (Sitodrepa panicea L.)

Ohio. T. H. Parks (July 25): A large grocery store in Marion County, central Ohio, troubled with this beetle in several food products.

RING-LEGGED EARWIG (Euborellia annulipes Lucas)

Mississippi. C. Lyle (July 25): On June 30 specimens of this earwig sent from Big Point, Jackson County, in the southern part of the State, with a report that severe injury to stored Irish potatoes had been observed. Specimens sent on July 22 from Grenada County, in the northern part of the State, with a report that they had damaged stored Irish potatoes to some extent.

EUROPEAN EARWIG (Forficula auricularia L.)

Utah. G. F. Knowlton (July 2): Well established at Farmington in Davis County, being abundant in many favorable places. (Det. by A. B. Gurney.)

A BEETLE (Microbregma emarginatum Duft.)

New Hampshire. E. P. Felt (July 22): Anobiid beetle found abundant in spruce slabs on a camp at Dublin, southwestern New Hampshire, loosening the bark and puncturing the wood.

SAWYERS (Monochamus spp.)

Massachusetts. A. I. Bourne (July 23): M. notatus Drury and M. scutellatus Say emerged from house timbers. In the case of the former species the adult bored out from the timber through the plaster and wall paper. The house was about 1 year old and was made from pine trees on the owner's property at Wilbrahan, in southern Massachusetts.

South Carolina. F. Sherman (July 26): The pine sawyer, M. titillator F., reported from Hampton County, in the southern part of the State.

A BORER (Hylotrupes bajalus L.)

Pennsylvania. H. E. Hodgkiss (July 26): Infestations in houses reported more generally than in other years. Some infestations observed causing severe damage.

BARK LICE (Psocidae)

Massachusetts. A. I. Bourne (July 23): Myriads of psocids reported on July 15, hiding beneath the shingles of a small bungalow near the College at Amherst, in western Massachusetts. These insects were present on the northeastern corner of the building, from the basement to the eaves, a section which is shaded throughout the day by nearby trees.

INSECT CONDITIONS IN HAWAII

By O. C. McBride

The Mediterranean fruitfly (Ceratitidis capitata Wied.) population level showed a gradual decrease from April 1931 through 1934. In 1935 there was a rapid increase in population level, reaching the peak in 1936. During 1937 the population level started to decline and at the present time, July 1, 1938, it is at about the 1932 level. Parasitization records of the Mediterranean fruitfly parasite (Opius humilis Silv.) for the period 1914-1933 shows that this species reaches its maximum abundance during March to May. During March to June 1938 parasite records were made on 260,000 fly pupae, field collected, only 4 specimens being obtained. Since last October only seven specimens have been recovered. These records are for the Island of Oahu.

Growers of Kauai have reported that the rice borer (Chilo simplex Butl.) in certain areas is causing considerable damage to rice and is more abundant than for the past 2 or 3 years.

The taro leafhopper (Megamelus proserpina Kirk.) on the Island of Oahu, at Honolulu and Kaneohe, is less abundant this season and is apparently coming under control.

D. T. Fullaway reports that coconut palm scale (Pinaspis buxi Bouche) is increasing on the windward side of the Island of Oahu. Twenty-five large coconut palms were killed during the month of June. The scale is quite bad on bananas. Several species of ornamental palms are attacked.

INSECT PEST SURVEY BULLETIN

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THE SPECIES AND DISTRIBUTION OF GRASSHOPPERS IN THE 1937 OUTBREAK

Robert L. Shotwell, Entomologist

The year 1937 was the fourth in which grasshoppers were collected in typical environments in the several States included in the annual grasshopper survey. Data from the 1934, 1935, and 1936 collections were published as supplements to the Insect Pest Survey Bulletin as follows: Nos. 9 in volume 14, 5 in volume 16, and 3 in volume 17, respectively.

The present report is based on data from collections made in 17 States, namely, Arkansas, Arizona, Colorado, Iowa, Kansas, Michigan, Minnesota, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, Utah, Wisconsin and Wyoming. These collections totaled 175,022 specimens. All were determined as to species or were classified undetermined as nymphs and other forms, and then counted. This represented an immense amount of work and should be credited to F. E. Skoog, field assistant, who had charge of the work of identification.

In a task of such huge dimensions there are bound to be weaknesses. The chief criticism has been the fact that in some places where several species occurred in large numbers whose seasonal histories do not coincide, collections made late in the summer do not show a representative number of the adults of the earlier species. To be more accurate in this respect, collections should be made several times between July 1 and September 1. Another weakness has been the fact that a few of the important species are more agile than are the collectors. Dissosteira longipennis Thos. does not appear in the collections in numbers representative of its abundance in the areas where it was the dominant species. Notwithstanding these weaknesses, it is believed that these data will have their place in a study of the grasshopper populations.

All of the 24 States located west of and including Michigan, Illinois, Missouri, Arkansas, and Texas experienced light to very severe infestations of grasshoppers during the summer. The most severe and widespread damage was done to small grains in eight counties in the northeastern quarter of South Dakota and to crop and range grasses in the entire southeastern quarter of Colorado. Severe damage was done to cotton in Texas and Oklahoma and spotted but severe injury occurred in corn, alfalfa, and small grains in other States. Over the entire area the total crop loss was estimated as being between one-half and one-third of the loss in 1936. Outside of this area, Indiana, Tennessee, Alabama, Mississippi, Florida, and other States reported either increased numbers of grasshoppers or minor outbreaks.

In the great wheat areas of the Plains States Melanoplus mexicanus Sauss. was by far the most important species. In areas of greater rainfall, such as the Corn Belt, where farming is more diversified, other species such as M. differentialis Thos., M. bivittatus Say, and M. femur-rubrum Deg., equaled or outnumbered M. mexicanus in many places. Camnula pellucida Scudd. was dominant in northern Michigan and Wisconsin and in parts of Oregon and California. In many parts of the area M. packardii Scudd. was also recorded as being numerous and important. M. differentialis was dominant, for the first time in history, in a part of Montana, namely, in Richland County, in the eastern part of the State. Before 1932 there had been no record of this species in the State. It spread from the southwestern quarter of North Dakota, east of the Badlands, where it was numerous in 1931, 1932, and 1933, and appeared for the first time near Glendive, Mont.

Another important feature of the outbreaks, during the last 4 years, was the increase in numbers and importance of Melanoplus femur-rubrum in practically all of the States and the development of a specific area of this species embracing north-central and northeastern Iowa, south-central and southeastern Minnesota, the southern half of Wisconsin, and part of northern Illinois. The most spectacular and publicized affair was the great outbreak of Dissosteira longipennis, which included all of southeastern Colorado, the extreme western part of Kansas, the Panhandle of Oklahoma, the northwestern counties of the Panhandle of Texas, and the extreme northeastern counties of New Mexico.

There was some hatching of Melanoplus mexicanus and M. bivittatus before May 1 and in southern Arizona as early as February 15. In many localities spring rains and cool weather delayed hatching from 2 to 3 weeks. Melanoplus differentialis and M. femur-rubrum were from 2 to 3 weeks later in hatching than were M. mexicanus and M. bivittatus. Over the entire area there were many places where the hatching of fall eggs of several species was prolonged up to the middle of July and the first of August. Dissosteira longipennis in Colorado and elsewhere started hatching the second week in May. Late hatching of some species in parts of the area delayed the necessity of control work until the latter part of July. This was caused by cool, rainy weather throughout June and part of July. Ninety percent of the poisoned bait used in Minnesota was distributed after July 26. Over the entire area these early rains delayed grasshopper activity.

A nymphal survey in May and June showed newly hatched nymphs to be congregated in restricted areas. On the range in Colorado the third week of May Dissosteira longipennis was observed in bands covering from 40 to 320 acres, and from 50 to 500 per square foot. These were in the first instar and were already migrating and spreading. If scattered over from 10 to 100 times their original hatching areas the population would still have been 50 per square yard, which is a very heavy infestation. One concentrated band observed at this time, if spread over an area of 50 square miles, would have populated it at the rate of 50 per square yard.

In the last week of May heavy concentrations of Melanoplus mexicanus and M. bivittatus occurred in alfalfa, pasture, draws, creek bottoms, stubble, and field margins. Some of these concentrations ranged from 300 to 500 hoppers per square yard. At that time there had been no general movement of these species to other crops from the breeding grounds. In South Dakota only 1 out of 5 to 10 fields near Huron was at first involved, because the infestations were spotted.

Well-tilled fields were at first free of hoppers. These spotted, very dense infestations spread over a wide territory adjacent to their original hatching ground. One quarter section of seedling alfalfa in this area had a population of 250 per square yard over the entire field. These hoppers could have consumed all of the grain in 8 or 10 sections.

In both the Huron and Winner areas of South Dakota many of the grassy headlands suitable for egg deposition of Melanoplus differentialis and M. bivittatus had been covered by blown soil and changed to hummocks of sandy loam covered with Russian-thistle. This condition was well suited for the egg deposition of M. mexicanus and in these places this species hatched in considerable numbers. An environmental factor suitable to certain species had been changed to one suitable for another. The fact that grasshoppers are important factors in soil blowing in South Dakota is now generally recognized. Most of the grain-fields destroyed in the eight counties in South Dakota started blowing as soon as the hoppers had taken off the grain.

There was a period of cold, rainy weather during the first 3 weeks of June. This retarded the nymphal development, and in northern Iowa, northern Montana, northern and northeastern Wyoming, and elsewhere destroyed from 25 to 50 percent of the newly hatched nymphs. It also delayed and seriously interfered with the baiting programs. Considerable bait was wasted by distribution under unfavorable conditions. For example, in one area farmers were spreading bait at 4 a.m., when the air temperature did not reach 70° F. until 10 or 11 a.m. This allowed the bait to dry out before the hoppers were ready to eat it. During such unfavorable conditions for baiting, there is still a gradual spread from the hatching areas without the opportunity to check it. Prolonged hatching aggravates the situation by increasing the number of bait applications necessary and adds a discouraging note to the whole program. In some instances first-instar individuals of Melanoplus mexicanus were found together in the same field with the gravid females.

The first record of adults was received from southwestern Oklahoma where 50 percent of Melanoplus mexicanus were adult by May 22. Oviposition by this species started July 1 and a second generation began hatching July 20, with adults appearing again by September 1. Egg deposition by this second generation began on September 20 and continued into November. In many localities in South Dakota, Nebraska, Kansas, Oklahoma, Missouri, Iowa, and other States this second generation occurred in numbers of 15 to 100 per square yard in alfalfa, stubble, and along field margins. These infestations actually developed into secondary outbreaks being especially injurious to newly sown winter wheat and necessitating control measures to protect crops. The State of Nebraska, recognizing this condition and desiring to protect crops from this second generation, went so far as to add 25 percent to the quantity of bait estimated from the fall egg survey as needed for control in 1938.

By June 20 a few adults of Melanoplus bivittatus were present, together with all instars. At this time M. differentialis and M. femur-rubrum were still in the first three instars. Melanoplus bivittatus started ovipositing after July 15 and M. differentialis about September 1. From then on until the middle of November, there was an almost continuously favorable period for egg deposition in most of the infested region. There was also plenty of green food for the development of eggs within the females.

During the summer there were fewer flights recorded than in 1936, which was probably due to the cooler weather and better food conditions. In the Dissosteira longipennis areas this species was migrating by foot or wing from hatching time until the females had settled down to egg deposition. Some 3 or 4 million acres were involved in Colorado alone. Melanoplus mexicanus spread over 33 counties east of the Missouri River in South Dakota from the 3 counties in the northeastern quarter and from local infestations; however, for the most part, migrations were from breeding grounds to adjacent crops.

Generally speaking, disease, parasites, and egg predators apparently did not reduce populations to any great degree during the summer. In some areas sarcophagid flies were a minor factor. During the egg survey bee fly, blister beetle, and carabid larvae were numerous, with from 40 to 70 percent of the egg pods attacked in some places in Missouri, Iowa, and Minnesota. Fungus disease occurred only occasionally.

Eggs of all species were, in general, easily found and well distributed over the entire region. In a few States, including Montana, Wyoming, Illinois, Kansas, and Nebraska, infestations are equal to or somewhat less than last year (1936). In many of the other States infestations are more widespread and more severe than they have been for several years. They increased in northern Michigan, all of Wisconsin, and in the southern half of Minnesota. The most severe infestations were found in Iowa, northern Missouri, and east of the Missouri River in North Dakota and South Dakota. Egg pods of Melanoplus differentialis ranged from 25 to 100 per square foot in many places in Iowa and Missouri. Other species were also numerous. One of the most startling facts was the finding of egg pods, mostly M. mexicanus, at each of 266 stops made in 33 counties east of the Missouri River in South Dakota. At 264 of these, 5 square-foot samples were taken from within each field, or a total of 1,320 square-foot samples. Egg pods were found in 1,238 of them, or in 15 out of 16 square-foot samples. In southern Wisconsin egg pods of Melanoplus femur-rubrum ranged from 4 or 5 per square foot in upland pastures to 6 or 8 in the bottom lands.

Infestations increased in the delta section of Arkansas, over most of Oklahoma, and in from 60 to 80 counties in northwestern, northern, and central Texas. In northeastern New Mexico there were 400 or 500 egg beds of Dissosteira longipennis from 4 to 10 acres in size, with from 8 to 30 pods per square foot. The average infestation in Arizona was about the same as in 1936, although there were shifts within the State.

In Colorado D. longipennis commanded the most interest. In the spring of 1937 it was estimated that 3,400,000 acres was infested at hatching time in 8 southeastern counties, whereas in the fall it was estimated that there were 4,025,760 acres of breeding areas in 12 counties, only 4 of which contained egg beds in the spring. Eight new counties became infested by D. longipennis during the season, while four of the counties having infestations last year were not included in the area in which egg beds were found in the fall. Owing to the great migrations of adults the infested area was almost directly west of where D. longipennis hatched the previous spring. Other species were also abundant in the irrigated sections of the State.

The adult survey indicated that there would be some outbreaks in Idaho, Utah, and Washington in 1938. Grasshoppers were also on the increase in widely separated parts of Oregon threatening serious damage in 1938.

The Nymphal Survey in 1938

The nymphal survey in the spring of 1938 more than bore out the predictions made from the adult and egg surveys in 1937. Enormous numbers of Melanoplus mexicanus hatched out in stubble, peppergrass prairie, and in idle or reverted lands in the Dakotas. From 1,000 to 8,000 per square yard were present in many places. Dissoptera longipennis first appeared in numbers as great as 10,000 per square yard. Generally speaking, rains and inclement weather delayed and prolonged hatching over the entire area.

The enormous number of eggs deposited during the fall was due to the prolonged favorable period for egg deposition. In the areas infested by Melanoplus mexicanus and M. differentialis the rainfall for the months of September, October, November, and December was about 50 percent of normal, and the favorable fall conditions permitted an unusual population increase through the development of a second generation, hatching late in July and in August, which reached maturity and deposited eggs. The first nymphs of the second generation were observed on July 20 and favorable oviposition weather continued until November 15, a period of approximately 130 days. This was ample time for the second generation to mature and oviposit, as is shown by the following record of a female M. mexicanus reared at room temperatures. The total span of life for this female was 108 days, 36 of which were required for nymphal development, 37 days from last molt to deposition of first egg pod, and 35 days from first to last egg pod deposited, in which period 10 pods containing a total of 197 eggs were laid.

In addition to the following detailed tabulations of the collections by States, a list is given for each State showing the five species indicated by these collections to be the most important in each habitat.

ARIZONA

Of the 1,020 specimens collected Melanoplus mexicanus was the most numerous and M. femur-rubrum was second. This is not a large enough collection to be representative of the relative numbers of the different species occurring in the State. Although there was a more general distribution of grasshoppers reported in the agricultural counties than in any previous year, the infestations were not severe or extensive.

Distribution by species of 1,020 specimens collected in Arizona, expressed in percentage of total number collected in each habitat

Species	:Small:	:Road:	:Environment:	:Weedy:	:Miscell-:	:Total:	:Percentage of
	:Grains:	:Legumes:	:side:	:Range:	:not shown:	:patches:	:specimens:
	:	:	:	:	:	:	: grand total
Anilocara elliotti Thos.	--	--	--	--	--	2	0.20
Ageneotettix deorum Scudd.	--	--	--	--	1.49	1	0.10
Brachystola sp.	--	0.19	--	--	--	1	0.10
Carnula pellucida Scudd.	--	0.75	--	10.20	--	9	0.88
Conozoa carinata Rehn.	--	1.12	--	8.57	--	17	1.67
Cordillacris crenulata Brun.	--	--	--	--	2.99	2	0.20
Dissosteira carolina L.	--	--	2.86	--	5.97	7	0.69
Melanoplus bivittatus Say	--	2.62	--	--	--	19	1.86
Melanoplus differentialis Thos.	1.11	1.87	--	--	--	15	1.47
Melanoplus fennur-rubrum Deg.	4.44	3.92	5.71	--	--	115	11.27
Melanoplus gladstoni Scudd.	2.22	1.68	37.14	4.08	--	11	1.08
Melanoplus lakinus Scudd.	13.39	0.75	--	--	--	21	2.06
Melanoplus mexicanus Sauss.	1.11	16.26	45.71	4.08	--	133	13.03
Melanoplus occidentalis Thos.	--	3.92	--	--	1.49	25	2.45
Melanoplus packardii Scudd.	--	0.56	--	--	5.97	7	0.69
Melanoplus sp.	--	1.12	--	--	--	6	0.59
Melanoplus yarrowii Thos.	--	0.75	--	--	--	4	0.39
Mermiria sp.	--	--	--	--	1.90	3	0.29
Opeia obscura Thos.	--	0.19	--	79.59	0.63	41	4.02
Opeia testacea Scudd.	--	1.71	--	--	--	7	0.69
Orphulella compta Scudd.	--	2.24	--	--	--	12	1.18
Psoloessa delicatula Scudd.	--	--	--	--	--	2	0.20
Schistocerca shoshone Thos.	1.11	--	--	--	--	1	0.10
Trachyrhachis kiowa Thos.	--	0.56	--	--	8.96	10	0.98
Trimerotropis pallidipennis Burm.	1.11	0.19	--	--	11.94	11	1.03
Xanthippus cornellipes Hald.	--	0.56	--	2.05	--	6	0.59
Adults undetermined	6.67	--	--	--	--	21	2.06
Nymphs undetermined	63.33	59.43	--	--	61.19	511	50.08

Total specimens per environment 90 : 535 : 35 : 49 : 86 : 153 : 67 : 1,020 : ---

ARIZONA

Small grains

	<u>Percent</u>
1. <i>Melanoplus lakinus</i> -----	19
2. <i>Melanoplus femur-rubrum</i> ---	4
3. <i>Melanoplus gladstoni</i> -----	2
4. <i>Melanoplus differentialis</i> -	1
5. <i>Melanoplus mexicanus</i> -----	1
6. Four other species -----	73
Undetermined adults, 7	
Nymphs, 63	

Legumes

1. <i>Melanoplus mexicanus</i> -----	16
2. <i>Melanoplus femur-rubrum</i> ---	4
3. <i>Melanoplus occidentalis</i> ---	4
4. <i>Melanoplus bivittatus</i> -----	3
5. <i>Orphulella compta</i> -----	2
6. Fifteen other species -----	71
Undetermined adults, none	
Nymphs, 59	

Roadside

1. <i>Melanoplus mexicanus</i> -----	46
2. <i>Melanoplus femur-rubrum</i> ---	37
3. <i>Conozoa carinata</i> -----	9
4. <i>Melanoplus differentialis</i> -	6
5. <i>Dissosteira carolina</i> -----	2

Range

1. <i>Carmula pellucida</i> -----	10
2. <i>Melanoplus femur-rubrum</i> ---	4
3. <i>Melanoplus mexicanus</i> -----	4
4. <i>Xanthippus corallipes</i> -----	2
Nymphs, 30	

Environment not shown

1. <i>Melanoplus mexicanus</i> -----	31
2. <i>Melanoplus femur-rubrum</i> ---	24
3. <i>Conozoa carinata</i> -----	9
4. <i>Melanoplus bivittatus</i> -----	6
5. <i>Melanoplus occidentalis</i> ---	3
6. Nine other species -----	27
Undetermined adults, 2	
Nymphs, 6	

Weedy patches

	<u>Percent</u>
1. <i>Melanoplus femur-rubrum</i> ---	34
2. <i>Mermiria</i> sp. -----	2
3. Four other species -----	64
Undetermined adults, 5	
Nymphs, 56	

Miscellaneous

1. <i>Trimerotropis pallidipennis</i>	12
2. <i>Trachyrhachis kiowa</i> -----	9
3. <i>Dissosteira carolina</i> L. ---	6
4. <i>Melanoplus packardii</i> -----	6
5. <i>Cord. crenulata</i> -----	3
6. Other species -----	64
Nymphs, 61	

Percentage of grand total

1. <i>Melanoplus mexicanus</i> -----	13
2. <i>Melanoplus femur-rubrum</i> ---	11
3. <i>Opeia obscura</i> -----	4
4. <i>Melanoplus occidentalis</i> ---	2
5. <i>Melanoplus lakinus</i> -----	2
6. Twenty-three other species	68
Undetermined, 2	
Nymphs, 50	

ARKANSAS

Only 537 specimens were collected in Arkansas during the adult survey. Of these M. mexicanus was most numerous, with M. differentialis second and M. ferrug-rubrum third. Seven counties in the northeastern part of the State constituted the only area included in the survey. In this area cotton, corn, and alfalfa were the most seriously damaged and soybeans were generally infested.

Distribution by species of 537 specimens collected in Arkansas, expressed in percentage of total number collected in each habitat

Species	Small grain	Corn	Legumes	Grassland	Environment: not shown	Total specimens	Percentage of grand total
						Number	
<u>Dissosteira carolina</u> L.	0.49	--	0.46	4.90	--	7	1.19
<u>Dichromorpha viridis</u> Scudd.	0.49	--	--	--	--	1	0.17
<u>Hippiscus rugosus</u> Scudd.	--	5.41	--	--	--	2	0.34
<u>Crphulella pelidna</u> Burn.	--	--	--	--	64.00	16	2.72
<u>Melanoplus differentialis</u> Thos.	21.56	32.43	20.09	9.80	--	110	18.73
<u>Melanoplus ferrug-rubrum</u> Deg.	10.29	2.70	24.20	20.59	4.00	97	16.52
<u>Melanoplus mexicanus</u> Sauss.	43.13	5.41	39.27	34.31	4.00	212	36.10
<u>Syrbula admirabilis</u> Uhler	--	--	--	--	23.00	7	1.19
Nymphs	24.01	21.62	15.93	25.43	--	121	20.61
Undetermined	--	32.43	--	1.96	--	14	2.38
Total specimens per environment	204	37	219	102	25	537	--

ARKANSAS

Small grains

	<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	43
2. <i>Melanoplus differentialis</i> ---	22
3. <i>Melanoplus femur-rubrum</i> -----	10
4. <i>Dissosteira carolina</i> -----	0.49*
5. <i>Dichromorpha viridis</i> -----	0.49*
6. One other species -----	24
Undetermined adults, 0	
Nymphs, 24	

Grassland

	<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	34
2. <i>Melanoplus femur-rubrum</i> -	21
3. <i>Melanoplus differentialis</i> 10	
4. <i>Dissosteira carolina</i> -----	5
5. Two other species -----	30
Undetermined adults, 2	
Nymphs, 23	

Corn

1. <i>Melanoplus differentialis</i> ---	32
2. <i>Hippiscus rugosus</i> -----	5
3. <i>Melanoplus mexicanus</i> -----	5
4. <i>Melanoplus femur-rubrum</i> -----	3
5. Two other species -----	54
Undetermined adults, 32	
Nymphs, 22	

Environment not shown

1. <i>Orphulella pelidna</i> -----	64
2. <i>Syrbula admirabilis</i> -----	28
3. <i>Melanoplus femur-rubrum</i> -----	4
4. <i>Melanoplus mexicanus</i> ---	4
Undetermined adults, 0	
Nymphs, 0	

Legumes

1. <i>Melanoplus mexicanus</i> -----	39
2. <i>Melanoplus femur-rubrum</i> -----	24
3. <i>Melanoplus differentialis</i> ---	20
4. <i>Dissosteira carolina</i> -----	0.46**
5. One other species -----	16
Undetermined adults, 0	
Nymphs, 16	

Percentage of grand total

1. <i>Melanoplus mexicanus</i> ---	36
2. <i>Melanoplus differentialis</i> 19	
3. <i>Melanoplus femur-rubrum</i> -	17
4. <i>Orphulella pelidna</i> -----	3
5. <i>Dissosteira carolina</i> ---	1
6. Five other species -----	24
Undetermined adults, 3	
Nymphs, 21	

* These two species equal 1.

** Taken as 1.

COLORADO

Other than *Dissosteira longipennis* on the rangelands in the southeastern quarter of the State, *M. mexicanus* and *M. bivittatus* were the most important species. In the total collection of 18,078 specimens for the State, *D. longipennis* does not show up in its true importance. This is due to the difficulty with which adults of this species are taken by the general method for collecting practiced in the survey. Therefore the table for the important species on the range must be considered as applying to species other than *D. longipennis*. *Melanoplus bivittatus* seems to have increased in relative numbers since 1935.

Species	Al- falfa- ture	Pas- corn	Road- side	Range- gums	Sor- beans	Small grains	Total toes	Percentage of grand total
Acrolophus hirtipes Say	0.03	0.04	0.06	---	---	---	---	0.02
Aeoloplus turnbulli Thos.	1.15	3.72	9.57	4.66	3.03	10.47	7.92	4.99
Aeropedellus clavatus Thos.	---	---	0.08	---	---	---	---	0.02
Ageneotettix decorum Scudd.	0.22	1.43	0.63	4.22	---	---	0.62	1.32
Amphitornus coloratus Thos.	---	0.20	0.13	2.89	---	---	0.62	0.63
Anabrus simplex Hald.	---	0.31	---	---	---	---	---	0.04
Arphia pseudonietana Thos.	0.22	2.18	0.27	8.01	0.51	---	0.21	0.02
Aulocara ellioti Thos.	---	0.39	---	0.25	---	---	1.25	2.24
Beapedon rubilum Say	0.05	0.75	0.31	0.03	0.17	---	---	0.12
Brachystola magna Gir.	0.22	---	0.09	0.03	---	---	---	0.33
Camula pellucida Scudd.	---	---	0.04	---	---	---	---	0.07
Cherthippus longicornis Latr.	---	0.33	0.04	12.22	---	---	---	0.01
Cerdillacris crenulata Brun.	---	0.26	0.09	1.21	---	---	---	2.45
Cerdillacris occipitalis Thos.	---	0.13	---	0.06	---	---	---	0.30
Deotylotum pictum Thos.	0.14	1.47	0.54	1.74	2.73	---	---	0.03
Derotmema haydenii Thos.	0.12	0.26	0.40	0.81	0.22	0.23	1.04	1.00
Dissosteira carolina L.	3.30	19.56	1.03	3.35	0.17	---	---	0.37
Dissosteira longipennis Thos.	0.02	0.35	0.13	2.53	---	---	0.42	6.13
Drepanopterna fenestrata Scudd.	---	---	---	---	---	---	---	0.62
Ercopitophus sordidus	---	---	---	---	---	---	---	---
costalis Scudd.	0.05	0.07	---	0.08	---	---	2.92	0.12
Hedrotettix trifasciatus Say	0.02	0.52	0.04	0.73	0.34	---	0.42	0.29
Hesperotettix speciosus Scudd.	---	0.82	0.81	0.48	0.17	---	0.21	0.70
Hesperotettix viridis Thos.	0.02	1.24	0.13	0.23	---	---	1.04	0.31
Hippiscus rugosus Scudd.	---	0.03	---	0.03	---	---	---	0.01
Hypochlora alba Dodge	---	0.03	---	---	---	---	---	0.01
Melanoplus angustipennis Dodge	1.99	6.42	3.95	5.34	4.79	3.33	0.83	4.32
Melanoplus arizonae Scudd.	---	0.13	---	---	---	---	---	0.02
Melanoplus bivittatus Say	24.91	4.60	15.35	8.16	11.79	14.76	9.17	11.42
Melanoplus bowditchi Scudd.	0.02	8.51	0.40	1.29	---	---	---	2.43
Melanoplus confusus Scudd.	---	---	---	0.03	---	---	---	0.01

Species	Al- :fal- :	Pas- :ture :	Corn :	Road- :side :	Range- :gums :	Beets- :	Beans- :	Small :grains :	Pota- :toes :	Total :speci- :mens :	Percentage of grand total
Melanoplus femur-rubrum Deg.	19.58	3.19	2.65	7.11	0.06	2.39	14.28	16.05	20.21	4,76	1,425
Melanoplus flavidus Scudd.	0.34	1.99	2.07	3.42	1.04	0.85	---	0.46	0.42	---	281
Melanoplus foedus Scudd.	2.38	8.80	19.31	18.63	4.55	15.04	0.95	8.94	6.25	9.52	1,745
Melanoplus gladstoni Scudd.	0.05	0.23	0.36	0.18	0.42	---	---	---	---	---	38
Melanoplus infantilis Scudd.	---	0.10	---	---	0.48	---	---	---	---	---	20
Melanoplus keeleri luridus Dodge	---	---	---	---	0.06	---	---	---	---	---	2
Melanoplus lakinus Scudd.	3.71	2.89	7.23	4.77	1.74	11.79	10.47	15.59	10.62	11.90	1,046
Melanoplus mexicanus Sauss.	7.61	7.56	20.25	15.80	4.66	25.98	3.33	13.53	18.33	9.52	1,936
Melanoplus occidentalis Thos.	0.07	1.66	0.27	0.93	2.81	---	---	---	---	---	191
Melanoplus packardii Scudd.	1.03	5.38	4.80	5.61	2.05	3.93	0.95	0.69	4.17	---	623
Melanoplus regalis Dodge	---	0.03	---	---	0.14	---	---	---	---	---	6
Merniria maculipennis Brun.	0.05	3.00	0.49	0.48	0.62	0.51	---	---	1.25	---	152
Merniria ne-mexicana Thos.	---	0.13	---	---	---	---	---	---	---	---	4
Metator pardalinus Sauss.	0.05	0.46	0.04	0.33	2.61	0.17	---	---	---	---	122
Opeia obscura Thos.	---	0.33	0.04	---	1.21	---	---	---	---	---	54
Orphulella pelidna Burn.	---	0.10	---	---	---	---	---	---	---	---	3
Pardalophora haldemanni Scudd.	---	---	0.04	---	---	---	---	---	---	---	1
Paropomala wyomingensis Thos.	---	1.73	0.04	0.06	0.34	---	---	---	---	---	68
Philobostroma quadrimaculatum Thos.	---	0.98	0.40	0.15	7.67	---	---	---	---	---	317
Phoetaliotes nebrascensis Thos.	---	1.47	0.36	0.15	0.11	0.34	---	---	---	---	64
Psoloessa delicatula delicatula Scudd.	---	---	---	---	0.06	---	---	---	---	---	2
Spharagenon collare Scudd.	0.86	1.86	1.08	0.66	1.41	1.20	---	0.69	0.42	---	201
Spharagenon equale Say	---	1.37	0.13	0.36	0.22	1.03	---	0.23	---	---	72
Trachyrhachis kiowa Thos.	0.02	0.49	0.04	0.06	3.26	---	---	---	0.21	---	136
Trimerotropis agrestis McNeill	---	0.03	---	0.06	---	---	---	---	---	---	3
Trimerotropis laticincta Sauss.	---	0.85	0.58	0.60	5.40	0.85	---	0.23	0.21	---	253
Trimerotropis pallidipennis Burr.	0.02	0.03	---	0.45	---	0.34	---	---	---	---	19
Tropidolophus formosus Say	---	---	---	---	0.08	---	---	---	---	---	3
Nymphs	13.49	0.52	1.48	6.87	5.76	0.51	24.76	---	7.08	---	1,134
Total specimens per environment	4,164	3,065	2,226	3,323	3,547	585	210	436	480	42	15,078

COLORADO

Alfalfa

Percent

1.	Melanoplus bivittatus -----	25
2.	Melanoplus femur-rubrum -----	20
3.	Melanoplus lakinus -----	9
4.	Dissosteira longipennis -----	8
5.	Melanoplus differentialis -----	8
6.	Twenty-four other species -----	30
	Nymphs, 13.49	

Sorghums

Percent

1.	Melanoplus mexicanus -----	26
2.	Melanoplus foedus -----	15
3.	Melanoplus bivittatus -----	12
4.	Melanoplus lakinus -----	12
5.	Aeoloplus turnbulli -----	8
6.	Nineteen other species -----	27
	Nymphs, 0.51	

Pasture

1.	Dissosteira longipennis -----	20
2.	Melanoplus foedus -----	9
3.	Melanoplus bowditchi -----	9
4.	Melanoplus mexicanus -----	8
5.	Melanoplus angustipennis -----	6
6.	Forty-six other species -----	48
	Nymphs, 0.52	

Beets

1.	Melanoplus differentialis -----	16
2.	Melanoplus bivittatus -----	15
3.	Melanoplus femur-rubrum -----	14
4.	Aeoloplus turnbulli -----	10
5.	Melanoplus lakinus -----	10
6.	Five other species -----	35
	Nymphs, 24.76	

Corn

1.	Melanoplus mexicanus -----	20
2.	Melanoplus foedus -----	19
3.	Melanoplus bivittatus -----	16
4.	Melanoplus lakinus -----	7
5.	Aeoloplus turnbulli -----	6
6.	Thirty-six other species -----	32
	Nymphs, 1.48	

Beans

1.	Melanoplus bivittatus -----	26
2.	Melanoplus femur-rubrum -----	16
3.	Melanoplus lakinus -----	16
4.	Melanoplus differentialis -----	15
5.	Melanoplus mexicanus -----	14
6.	Eight other species -----	13
	Nymphs, 0	

Roadside

1.	Melanoplus foedus -----	19
2.	Melanoplus mexicanus -----	14
3.	Aeoloplus turnbulli -----	10
4.	Melanoplus bivittatus -----	8
5.	Melanoplus femur-rubrum -----	7
6.	Twenty-nine other species -----	42
	Nymphs, 6.57	

Small grains

1.	Melanoplus femur-rubrum -----	20
2.	Melanoplus mexicanus -----	18
3.	Melanoplus lakinus -----	11
4.	Melanoplus bivittatus -----	9
5.	Aeoloplus turnbulli -----	8
6.	Nineteen other species -----	34
	Nymphs, 7.08	

Range*

1.	Cordillacris crenulata -----	12
2.	Aulocara ellioti -----	8
3.	Phlibostroma quadrimaculatum -----	8
4.	Trimerotropis laticincta -----	5
5.	Melanoplus angustipennis -----	5
6.	Forty-four other species -----	62
	Nymphs, 5.76	

Potatoes

1.	Aeoloplus turnbulli -----	31
2.	Melanoplus bivittatus -----	14
3.	Melanoplus differentialis -----	14
4.	Melanoplus lakinus -----	12
5.	Melanoplus mexicanus -----	10
6.	Three other species -----	19
	Nymphs, 0	

*Other than Dissosteira longipennis

COLORADO Continued

Percentage of grand total

1.	Melanoplus bivittatus	11
2.	Melanoplus mexicanus	11
3.	Melanoplus foedus	10
4.	Melanoplus femur-rubrum	8
5.	Dissosteira longipennis	6
6.	Fifty-four other species	54
	Nymphs,	6.24

ICWA

In Iowa 14,607 specimens were collected. The most important species from the standpoint of relative numbers was M. femur-rubrum, with M. mexicanus second, M. differentialis third, and M. bivittatus fourth. A great number of nymphs made up the collections and these were not determined. Most of them were probably the second generation of M. mexicanus.

From infestations limited to 27 counties in the western third of the State in 1935, populations built up to outbreak numbers in all counties of the State in 1937. Heavy rains in the spring of 1933 delayed hatching and it is probable that the populations have been reduced, although this has not been determined with any degree of accuracy.

The preponderant species in this State were M. differentialis in the southern and southwestern parts; M. mexicanus and M. bivittatus in the western and northwestern parts; and M. femur-rubrum in the northern, east-central, and northeastern parts.

Distribution by species of 14,607 specimens collected in Iowa, expressed in percentage of total number collected in each habitat

Species	Leg- umes	Road- side	Pas- ture	Small grains	River bot- tom	Weeds	Environ- ment not given	Corn	Fence	Total	Percent
Acrolophus hirtipes Say	---	---	0.02	---	---	---	---	---	---	1:	0.01
Aeoloplus turnbullii bruneri Caud.	---	---	0.32	---	---	---	---	---	---	13:	0.09
Aeropedellus clavatus Thos.	---	---	---	---	---	---	---	---	---	19:	0.13
Ageneotettix deorum Scudd.	1.44	1.31	3.78	1.55	---	0.83	---	5.77	1.45	345:	2.36
Arphia pseudonietana Thos.	---	---	0.02	---	---	---	---	---	---	4:	0.03
Aulocara eliotti Thos.	---	---	0.30	0.13	---	---	3.80	---	---	44:	0.30
Chorthippus longicornis Latr.	---	---	0.02	---	2.58	---	---	---	---	15:	0.10
Cordillacris occipitalis Thos.	---	---	---	---	---	---	3.84	---	---	18:	0.12
Derothema haydenii Thos.	0.02	---	---	---	---	---	---	---	---	1:	0.01
Dichromorpha viridis Scudd.	---	0.06	0.05	---	---	---	---	---	---	3:	0.02
Dissosteira carolina L.	0.18	1.42	0.50	0.13	0.37	---	---	---	0.29	59:	0.40
Encyrtolophus sordidus costalis Scudd.	---	0.23	---	---	---	---	---	---	---	4:	0.03
Encyrtolophus sordidus sordidus Burm.	0.06	0.23	0.12	0.07	---	---	0.64	---	---	16:	0.11
Eucrotettix trifasciatus Say	---	---	0.05	---	---	---	---	---	---	2:	0.01
Eucrotettix viridis Thos.	---	---	0.10	---	---	---	0.21	---	---	5:	0.03
Hippiscus rugosus Scudd.	---	0.06	0.32	---	0.19	---	0.43	1.92	0.29	19:	0.13
Melanoplus bivittatus Say	4.69	12.06	0.67	3.43	2.95	2.75	---	3.85	20.29	626:	4.28
Melanoplus confusus Scudd.	---	---	0.05	---	---	---	1.28	---	---	8:	0.05
Melanoplus differentialis Thos.	4.16	7.45	2.04	2.83	10.86	1.38	1.71	30.77	37.67	684:	4.68
Melanoplus femur-rubrum Deg.	33.86	52.35	40.54	38.01	46.39	---	3.84	23.08	10.72	5,121:	35.03
Melanoplus gladstoni Scudd.	0.28	---	---	0.07	---	---	0.21	---	---	16:	0.11
Melanoplus keeleri luridus Dodge	0.02	---	0.02	---	---	---	2.35	---	---	13:	0.09
Melanoplus mexicanus Sauss.	13.38	10.30	17.16	10.30	3.68	3.03	7.05	5.77	7.82	1,802:	12.33
Melanoplus occidentalis Thos.	---	---	---	0.07	---	0.83	9.13	---	---	65:	0.44
Melanoplus packardii Scudd.	0.24	0.46	0.15	---	---	0.55	---	---	---	28:	0.19
Mestobregma plattei Thos.	---	0.06	---	---	---	---	---	---	---	1:	0.01
Orphulella pelidna Burm.	0.08	0.60	3.09	0.30	---	---	0.85	---	0.29	147:	1.01
Orphulella speciosa Scudd.	---	---	0.37	0.07	---	---	4.91	---	---	39:	0.27
Photallotes nebrascensis Thos.	---	0.17	0.10	0.40	---	---	6.84	---	---	45:	0.31
Schistocerca lineata Scudd.	0.02	---	---	---	---	---	---	---	---	1:	0.01
Spharagemon collaris Scudd.	0.02	---	---	---	---	---	---	---	---	1:	0.01
Spharagemon equale Say	---	---	---	0.07	---	---	---	---	---	2:	0.01
Syrbula admirabilis Uhl.	---	---	0.07	---	---	---	---	---	---	3:	0.02
Trachyrhachis kiowa Thos.	0.18	---	0.07	---	---	---	0.21	---	---	13:	0.09
Nymphs	41.04	13.14	29.93	44.49	32.95	90.61	36.10	28.35	21.16	5,424:	37.10
Total specimens per environment	5,059	1,755	4,012	1,484	543	363	468	52	345	14,607:	---

IOWA

Legumes

	<u>Percent</u>
1. <i>Melanoplus femur-rubrum</i> -----	34
2. <i>Melanoplus mexicanus</i> -----	13
3. <i>Melanoplus bivittatus</i> -----	5
4. <i>Melanoplus differentialis</i> -----	4
5. <i>Ageneotettix deorum</i> -----	1
6. Eleven other species -----	43
Nymphs, 41.04	

Weeds

	<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	3
2. <i>Melanoplus bivittatus</i> -----	3
3. <i>Melanoplus differentialis</i> -----	1
4. <i>Ageneotettix deorum</i> -----	1
5. <i>Melanoplus occidentalis</i> -----	1
6. One other species -----	91
Nymphs, 90.61	

Roadside

1. <i>Melanoplus femur-rubrum</i> -----	52
2. <i>Melanoplus bivittatus</i> -----	12
3. <i>Melanoplus mexicanus</i> -----	10
4. <i>Melanoplus differentialis</i> -----	7
5. <i>Dissosteira carolina</i> -----	1
6. Nine other species -----	18
Nymphs, 13.14	

Range

1. <i>Ageneotettix deorum</i> -----	13
2. <i>Melanoplus occidentalis</i> -----	9
3. <i>Melanoplus mexicanus</i> -----	7
4. <i>Phoetaliotes nebrascensis</i> -----	7
5. <i>Orphulella speciosa</i> -----	5
6. Fourteen other species -----	59
Nymphs, 36.10	

Pasture

1. <i>Melanoplus femur-rubrum</i> -----	41
2. <i>Melanoplus mexicanus</i> -----	17
3. <i>Ageneotettix deorum</i> -----	4
4. <i>Orphulella pelidna</i> -----	3
5. <i>Melanoplus differentialis</i> -----	2
6. Nineteen other species -----	33
Nymphs, 29.93	

Environment not given

1. <i>Aulocara elliotti</i> -----	4
2. <i>Melanoplus occidentalis</i> -----	3
3. <i>Melanoplus mexicanus</i> -----	1
4. Other species -----	92
Nymphs, 91.63	

Small grains

1. <i>Melanoplus femur-rubrum</i> -----	36
2. <i>Melanoplus mexicanus</i> -----	10
3. <i>Melanoplus bivittatus</i> -----	3
4. <i>Melanoplus differentialis</i> -----	3
5. <i>Ageneotettix deorum</i> -----	2
6. Nine other species -----	46
Nymphs, 44.49	

Corn

1. <i>Melanoplus differentialis</i> -----	31
2. <i>Melanoplus femur-rubrum</i> -----	23
3. <i>Ageneotettix deorum</i> -----	6
4. <i>Melanoplus mexicanus</i> -----	6
5. <i>Melanoplus bivittatus</i> -----	4
6. One other species -----	30
Nymphs, 28.85	

River bottom

1. <i>Melanoplus femur-rubrum</i> -----	46
2. <i>Melanoplus differentialis</i> -----	11
3. <i>Melanoplus mexicanus</i> -----	4
4. <i>Melanoplus bivittatus</i> -----	3
5. <i>Chorthippus longicornis</i> -----	3
6. Two other species -----	33
Nymphs, 32.95	

Fence row

1. <i>Melanoplus differentialis</i> -----	38
2. <i>Melanoplus bivittatus</i> -----	20
3. <i>Melanoplus femur-rubrum</i> -----	11
4. <i>Melanoplus mexicanus</i> -----	8
5. <i>Ageneotettix deorum</i> -----	1
6. Three other species -----	22
Nymphs, 21.16	

Percentage of grand total

1.	Melanoplus femur-rubrum -----	35
2.	Melanoplus mexicanus -----	12
3.	Melanoplus differentialis ----	5
4.	Melanoplus bivittatus -----	4
5.	Ageneotettix deorum -----	2
6.	Twenty-nine other species ----	42
	Nymphs, 37	

KANSAS

Of the 9,492 specimens taken in Kansas, Melanoplus mexicanus was dominant with M. differentialis second in importance. The most severe infestations occurred in the north-central part of the State. There was a second generation of mexicanus. Egg deposition by this generation began about September 20 and continued until late in November.

Species	: Small : : grains :	: Leg- : Pas- : Corn : : un- : es : ture :	: Weedy : : es :	: Wind- : Road- : bot- : : rows : side : ton :	: Creek : Environ- : : ment not :	: Range : Grass- : speci- : : land : mens :	: Total : : Number :	: Percent- : age of :
Aeoloplus turnbulli Thos.	1.67	0.09:0.90:	---	4.33: 3.23: 3.77: 0.33:	0.97: 1.91:	---	142:	1.49
Acrolophus hirtipes Say.	---	0.14:	---	---	---	---	2:	0.02
Agonotettix deorum Scudd.	0.37	1.42:3.50:	3.05:	0.09: 0.44: 0.66:	11.44: 3.23: 14.36:	---	343:	3.60
Amphitornus coloradus Thos.	---	---	---	---	---	0.19:	1:	0.01
Aulocara elliotti Thos.	1.74	0.09:1.30:	---	0.19: 0.44: 0.33:	2.27:12.18:	0.39:	173:	1.32
Boopedon nubilum Say	---	0.14:	---	---	---	2.14:	15:	0.17
Boopedon maculatum Caud.	0.06	0.07:	0.61:	---	---	---	3:	0.03
Cordillacris occipitalis Thos.	---	---	---	---	0.73:	---	5:	0.05
Cordillacris crenulata Brun.	---	0.07:	---	0.44:	0.41:59.75:	---	413:	4.34
Derotmena haydenii Thos.	---	---	---	0.44:	0.29:	---	3:	0.03
Dissosteira carolina L.	0.50	0.09: 0.09:	---	3.23: 2.19:	---	---	16:	0.17
Dissosteira longipennis Thos.	0.06	0.09: 0.09:	---	19.67: 3.51:	0.08: 0.44:	---	26:	0.27
Drepanopterna femoratum Scudd.	0.06	---	---	---	3.33:	---	24:	0.25
Encoptolophus sordidus costalis Scudd.	0.12	---	---	---	---	---	2:	0.02
Hadrotettix trifasciatus Say	---	0.14:0.14:	---	---	0.33:	---	11:	0.12
Hesperotettix speciosus Scudd.	---	---	12.77:	2.34:	---	0.53:	147:	1.54
Hesperotettix viridis Thos.	---	0.14: 0.42:	1.22:	---	---	---	4:	0.04
Hippiscus rugosus Scudd.	0.06	---	---	---	---	0.97:	12:	0.13
Hypochochloa alba Dodge	---	---	---	---	---	0.19:	1:	0.01
Melanoplus angustipennis Dodge	---	0.14: 0.61:	---	---	---	---	6:	0.06
Melanoplus bivittatus Say	1.12	5.99:1.31:	6.71:	0.33:26.40:	5.51:	0.19:	330:	3.47
Melanoplus bispinosus Scudd.	---	0.37: 0.09:	0.23:	---	0.24:	---	11:	0.12
Melanoplus confusus Scudd.	---	0.09:0.23:	---	0.33:	0.16:	---	9:	0.09
Melanoplus differentialis Thos.	4.03	3.77:0.21:	14.02:	0.44:10.56:	3.11:	---	415:	4.37
Melanoplus flavidus Scudd.	---	0.23: 0.06:	0.61:	---	---	---	5:	0.05
Melanoplus foedus fluvialis Brun.	0.06	0.55: 0.96:	0.07:	---	0.49:	---	14:	0.15
Melanoplus ferur-rubrun Deg.	0.31	0.96:0.07:	7.32:	1.98:	---	3.30:	76:	0.30
Melanoplus foedus foedus Scudd.	---	0.09: 0.09:	---	0.33:	0.15:	---	5:	0.05
Melanoplus infantilis Scudd.	---	---	---	0.08:	---	---	1:	0.01
Melanoplus impiger Scudd.	---	0.73: 0.06:	---	0.16:	---	---	19:	0.20

Distribution by species, of 9,492 specimens collected in Kansas, expressed in percentage of total number collected in each habitat--Continued

Species	Small	Legs	Pas-	Corn	patch	Weedy	Wind	Road	Creek	Environ-	Range	Grass	Speci-	age of
	Grains	ures	ture		es		rows	side	bot-	ment	not:	Land	mens	grand total
													Number	
Melanoplus mexicanus Sauss.	31.25	10.74	7.68	55.43	8.64	1.64	15.35	14.35	5.84	1.61	8.15	1.239	13.01	
Melanoplus occidentalis Thos.	0.06				0.09					5.14			37	0.39
Melanoplus packardii Scudd.	2.73	2.06	2.07	2.44	0.09		6.14	3.63	1.73	0.44	2.14	184	1.93	
Melanoplus lakinus Scudd.	1.92	0.64	0.07	1.22	0.19		3.95	1.32	1.30		0.97	34	0.83	
Melanoplus regalis Dodge	0.06		0.14		0.19			0.99	0.49	0.29	0.19	17	0.18	
Mermiria maculipennis Brun.	0.06		1.31	1.22				3.96	0.16	0.15	1.55	45	0.47	
Mermiria neomexicana Thos.			0.55								0.53	11	0.12	
Metator pardalinus Sauss.										0.29		2	0.02	
Nymphs	51.96	65.49	75.43	4.27	72.37		49.99	29.04	36.50	1.03		4,803	50.43	
Opeia obscura Thos.			0.07						3.73		37.85	242	2.54	
Orphulella speciosa Scudd.			2.03						0.32		0.03	38	0.40	
Orphulella pelidna Burn.		0.14									13.93	75	0.79	
Paradalcphora sp.		0.05										1	0.01	
Philobostroma quadrimacul-														
atum Thos.	0.12	0.41	0.35					1.65	15.90	3.03	3.69	257	2.70	
Phaetaliotes nebrascensis Thos.			0.14	1.22							0.58	7	0.07	
Schistocerca lineata Scudd.	0.06											1	0.01	
Spharagemon collaris Scudd.	0.12	0.09					6.56	3.95	0.08			18	0.19	
Spharagemon equale Say	0.25	0.32	0.07					0.88		0.29		16	0.17	
Syrbula admirabilis Uhl.			0.42						0.03		6.21	39	0.41	
Trimerotropis laticincta Sauss.							54.10			0.29		35	0.37	
Trachyrhachis kiowa Thos.	0.12	0.09	0.35				11.48	1.32	3.89	4.40	0.97	102	1.07	
Undetermined	0.06	0.09										3	0.03	
Total specimens per environment	1,612	2,186	1,444	164	1,065	61	228	303	1,233	681	515	9,492	--	

KANSAS

Small grains

Percent

1.	Melanoplus mexicanus	-----	31
2.	Melanoplus differentialis	---	4
3.	Melanoplus packardii	-----	3
4.	Melanoplus lakinus	-----	2
5.	Aulocara ellioti	-----	2
6.	Twenty-one other species	---	56
			Nymphs, 51.96
			Undetermined adults, 0.06

Legumes

1.	Melanoplus mexicanus	-----	11
2.	Melanoplus differentialis	---	9
3.	Melanoplus bivittatus	-----	6
4.	Melanoplus packardii	-----	2
5.	Ageneotettix deorum	-----	1
6.	Twenty-five other species	---	71
			Nymphs, 65.49
			Undetermined adults, 0.09

Pasture

1.	Melanoplus mexicanus	-----	8
2.	Ageneotettix deorum	-----	4
3.	Orphulella speciosa	-----	2
4.	Melanoplus packardii	-----	2
5.	Aulocara ellioti	-----	2
6.	Twenty-three other species	---	82
			Nymphs, 75.43

Corn

1.	Melanoplus mexicanus	-----	55
2.	Melanoplus differentialis	---	14
3.	Melanoplus femur-rubrum	----	7
4.	Melanoplus bivittatus	-----	7
5.	Ageneotettix deorum	-----	3
6.	Nine other species	-----	14
			Nymphs, 4.27

Weedy patches

1.	Hesperotettix speciosus	-----	13
2.	Melanoplus mexicanus	-----	9
3.	Aeoloplus turnbulli	-----	5
4.	Aulocara ellioti	-----	0.19*
5.	Melanoplus lakinus	-----	0.19*
6.	Five other species	-----	72
			Nymphs, 72.87

Windrows

Percent

1.	Trimerotropis laticincta	---	54
2.	Derotmena longipennis	-----	20
3.	Trachyrhachis kiowa	-----	11
4.	Spharagemon collare	-----	7
5.	Aeoloplus turnbulli	-----	3
6.	Two other species	-----	5
			Nymphs, none

Roadside

1.	Melanoplus mexicanus	-----	15
2.	Aeoloplus turnbulli	-----	9
3.	Melanoplus packardii	-----	6
4.	Melanoplus lakinus	-----	4
5.	Spharagemon collare	-----	4
6.	Twelve other species	-----	62
			Nymphs, 49.99

Creek bottom

1.	Melanoplus bivittatus	-----	26
2.	Melanoplus mexicanus	-----	15
3.	Melanoplus differentialis	---	11
4.	Mermiria maculipennis	-----	4
5.	Melanoplus packardii	-----	4
6.	Twelve other species	-----	40
			Nymphs, 29.04

Environment not shown

1.	Philibostroma quadrinaculatum	-----	16
2.	Ageneotettix deorum	-----	11
3.	Melanoplus differentialis	---	8
4.	Melanoplus mexicanus	-----	6
5.	Melanoplus bivittatus	-----	6
6.	Nineteen other species	-----	53
			Nymphs, 36.50

Range

1.	Cordillacris crenulata	-----	60
2.	Aulocara ellioti	-----	12
3.	Melanoplus occidentalis	-----	5
4.	Trachyrhachis kiowa	-----	4
5.	Drepanopterna femoratum	----	3
6.	Sixteen other species	-----	16
			Nymphs, 1.03

*These two species equal 1.

KANSAS---Continued

Grassland

	Percent
1. Opeia obscura -----	38
2. Ageneotettix deorum -----	14
3. Orphulella pelidna -----	14
4. Melanoplus mexicanus -----	8
5. Syrbula admirabilis -----	6
6. Seventeen other species -----	20
Nymphs, none	

Percentage of grand total

1. Melanoplus mexicanus -----	13
2. Melanoplus differentialis -----	4
3. Cordillacris crenulata -----	4
4. Ageneotettix deorum -----	4
5. Melanoplus bivittatus -----	3
6. Forty-seven other species -----	72
Nymphs, 50.43	

MICHIGAN

The most severe infestations were limited to the northern half of the Lower Peninsula. There were 2,532 specimens collected, most of which were Melanoplus mexicanus. Camula pellucida was second in numbers and M. femur-rubrum third.

Species	:Small :grains:	:Inland:	:Corn:	:Leg- umes:	:Pas- ture:	:Environ- ment not speci- ally shown:	:Total :mens : grand tota :Number:	:Percent- age of
Ageneotettix deorum Scudd.	---	---	---	---	1.53:	2.73	50:	1.94
Arphia pseudonietana Thos.	---	4.17:	---	---	1.01:	1.44	30:	1.16
Cannula pellucida Scudd.	---	29.17:	---	9.43:	17.25:	7.67	354:	13.70
Chorthippus longicornis Latr.	---	---	---	1.89:	---	---	1:	.04
Dissosteira carolina L.	---	---	---	---	---	.1	1:	.04
Encyrtolophus sordidus costalis Scudd.	---	4.17:	---	---	---	.44	5:	.19
Encyrtolophus sordidus sordidus Burn.	---	---	---	---	.13:	---	2:	.08
Melanoplus angustipennis Dodge	---	---	---	---	---	1.00	9:	.35
Melanoplus bivittatus Say	---	---	---	---	.13:	.33	5:	.19
Melanoplus dawsoni Scudd.	---	---	---	---	.13:	---	2:	.08
Melanoplus femur-rubrum Deg.	---	---	---	15.09:	3.03:	4.89	100:	3.87
Melanoplus infantilis Scudd.	---	---	---	---	.19:	---	3:	.12
Melanoplus keeleri luridus Dodge	---	---	---	---	.13:	---	2:	.08
Melanoplus mexicanus Sauss.	100.0:	54.17:	100.0:	73.58:	76.09:	80.10	1,999:	77.36
Orphulella speciosa Scudd.	---	---	---	---	.13:	---	2:	.08
Schistocerca alutacea Harr.	---	---	---	---	---	.44	4:	.15
Spharagomon collaris Scudd.	---	---	---	---	.19:	.89	11:	.43
Nymphs	---	8.33:	---	---	---	---	2:	.08
Total specimens per environment	8	24	15	53	1,582	900	2,582:	---

MICHIGAN

<u>Small grains</u>		<u>Pasture</u>	
	<u>Percent</u>		<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	100	1. <i>Melanoplus mexicanus</i> -----	76
Nymphs, 0		2. <i>Camnula pellucida</i> -----	17
<u>Inland</u>		3. <i>Melanoplus femur-rubrum</i> ----	3
1. <i>Melanoplus mexicanus</i> -----	54	4. <i>Ageneotettix deorum</i> -----	2
2. <i>Camnula pellucida</i> -----	29	5. <i>Arphia pseudonietana</i> -----	1
3. <i>Arphia pseudonietana</i> ----	4	6. Seven other species -----	1
4. <i>Encoptolophus sordidus</i> -----	4	Nymphs, 0	
5. One other species -----	9	<u>Environment not shown</u>	
Nymphs, 8.33		1. <i>Melanoplus mexicanus</i> -----	80
<u>Corn</u>		2. <i>Camnula pellucida</i> -----	8
1. <i>Melanoplus mexicanus</i> -----	100	3. <i>Melanoplus femur-rubrum</i> ----	5
Nymphs, 0		4. <i>Ageneotettix deorum</i> -----	3
<u>Legumes</u>		5. <i>Arphia pseudonietana</i> -----	1
1. <i>Melanoplus mexicanus</i> -----	74	6. Six other species -----	3
2. <i>Melanoplus femur-rubrum</i> ----	15	Nymphs, 0	
3. <i>Camnula pellucida</i> -----	9		
4. <i>Chorthippus longicornis</i> -----			
Latr. -----	2		
Nymphs, 0			

Percentage of grand total

1. <i>Melanoplus mexicanus</i> -----	77
2. <i>Camnula pellucida</i> -----	14
3. <i>Melanoplus femur-rubrum</i> ----	4
4. <i>Ageneotettix deorum</i> -----	2
5. <i>Arphia pseudonietana</i> -----	1
6. Thirteen other species -----	2
Nymphs, 0.08	

MINNESOTA

Infestations increased in the southern half of the State during 1937. There were 10,583 specimens collected in the State, of which *Camnula pellucida* was the most numerous, *Melanoplus mexicanus* second, *M. femur-rubrum* third, and *M. bivittatus* fourth. *M. mexicanus* went from fourth place in 1935 to second place in 1937, making this exchange with *M. bivittatus*.

Species	Small : grains	Leg-umes	Meadow	Pas-tures	Road-side	Idle : land	Flax	Environ-ment	Total : speci-	Percent- age of
								given	mens	grand total
									Number	
Aeropedellus clavatus Thos.	5.24	4.36	9.32	4.21	1.62	3.68	---	6.32	1:	.01
Ageneotettix deorum Scudd.	.09	.05	.88	.25	.06	.15	---	.57	605:	5.57
Arphia pseudonietana Thos.	20.70	16.51	14.79	56.15	29.55	37.41	5.70	32.76	2,342:	21.55
Aulocara allioti Thos.	.86	.63	1.73	3.45	.50	4.29	---	---	151:	.01
Carmula pellucida Scudd.	3.50	1.72	.88	1.36	1.34	1.81	5.70	10.02	452:	1.79
Chorthippus longicornis Latr.	2.96	3.48	10.17	11.84	5.67	2.81	1.63	9.77	695:	3.97
Disosteira carolina L.	---	---	.02	---	---	---	---	---	1:	.01
Encyrtoclopus sordidus Scudd.	---	---	.06	---	---	---	---	---	2:	.02
Eritettix simplex tricarminatus Thos.	4.52	.92	2.17	12:	75:	3.07	---	---	221:	2.03
Hesperotettix viridis Thos.	13.55	10.64	5.28	10.36	15.32	13.13	19.13	9.77	1,161:	10.68
Melanoplus angustipennis Dodge	---	.05	.03	---	.19	.31	---	---	7:	.06
Melanoplus bivittatus Say	---	.05	.03	---	.19	.31	---	---	2:	.02
Melanoplus bruneri Scudd.	5.54	4.63	7.91	8.23	6.04	9.50	1.23	.57	711:	6.54
Melanoplus confusus Scudd.	20.54	20.95	9.35	9.25	8.47	7.03	30.88	7.47	1,593:	14.70
Melanoplus dawsoni Scudd.	.95	2.42	3.01	3.03	.31	1.23	---	.57	205:	1.89
Melanoplus gladstoni Scudd.	.09	.73	2.73	.62	.12	---	---	---	122:	1.03
Melanoplus infantilis Scudd.	.09	.32	.03	---	.12	.15	---	---	14:	.13
Melanoplus keeleri luridus Dodge	15.50	16.94	22.67	7.54	8.53	10.27	37.93	11.49	1,761:	16.20
Melanoplus mexicanus Saus.	2.71	2.47	1.10	.37	2.87	1.36	1.85	3.45	213:	1.96
Melanoplus packardii Scudd.	.09	.10	.22	---	---	---	---	.57	12:	.11
Metator pardalinus Saus.	---	.15	---	---	---	---	---	---	3:	.03
Opeta obscura Thos.	.63	.30	.50	---	.12	.15	---	---	40:	.37
Orphulella pelidna Burr.	.27	.10	.91	.12	.37	.15	---	1.15	47:	.43
Orphulella speciosa Scudd.	.27	.63	1.79	.12	.19	---	---	1.15	83:	.76
Photaltictes nebrascensis Thos.	1.49	1.50	2.64	.37	1.68	3.53	1.23	2.67	203:	1.91
Spharagmen collaris Scudd.	---	---	---	---	.06	---	---	---	1:	.01
Stethophyma lineatum Scudd.	.23	.53	2.83	1.23	.12	.15	---	.57	121:	1.11
Trachyrhachis kiowa Thos.	---	1.06	.25	---	.37	---	---	---	76:	.33
Nymphs	---	---	---	---	---	---	---	---	---	---
Total specimens per environment	2,210	2,062	3,179	811	1,603	652	162	174	10,853:	---

MINNESOTA

Small grains

Percent

1.	Melanoplus femur-rubrum	21
2.	Camnula pellucida	21
3.	Melanoplus mexicanus	16
4.	Melanoplus bivittatus	14
5.	Melanoplus dawsoni	6
6.	Sixteen other species	22
	Nymphs,	0

Legumes

1.	Melanoplus femur-rubrum	29
2.	Melanoplus mexicanus	17
3.	Camnula pellucida	16
4.	Melanoplus bivittatus	11
5.	Melanoplus dawsoni	6
6.	Twenty other species	21
	Nymphs,	1.06

Meadow

1.	Melanoplus mexicanus	23
2.	Camnula pellucida	15
3.	Encoptolophus sordidus costalis	11
4.	Ageneotettix deorum	9
5.	Melanoplus dawsoni	8
6.	Twenty-one other species	34
	Nymphs,	0.25

Pastures

1.	Camnula pellucida	36
2.	Encoptolophus sordidus costalis	12
3.	Melanoplus bivittatus	10
4.	Melanoplus femur-rubrum	9
5.	Melanoplus dawsoni	9
6.	Nineteen other species	24
	Nymphs,	0

Roadside

Percent

1.	Camnula pellucida	3
2.	Melanoplus bivittatus	1
3.	Dissosteira carolina	1
4.	Melanoplus mexicanus	
5.	Melanoplus femur-rubrum	
6.	Eighteen other species	2
	Nymphs,	0.37

Idle land

1.	Camnula pellucida	3
2.	Melanoplus bivittatus	1
3.	Melanoplus mexicanus	1
4.	Melanoplus dawsoni	
5.	Melanoplus femur-rubrum	
6.	Eighteen other species	2
	Nymphs,	0

Flax

1.	Melanoplus mexicanus	3
2.	Melanoplus femur-rubrum	3
3.	Melanoplus bivittatus	1
4.	Camnula pellucida	
5.	Dissosteira carolina	
6.	Four other species	3
	Nymphs,	0

Environment not shown

1.	Camnula pellucida	3
2.	Melanoplus mexicanus	1
3.	Dissosteira carolina	1
4.	Encoptolophus sordidus costalis	1
5.	Melanoplus bivittatus	1
6.	Eleven other species	2
	Nymphs,	0

Percentage of grand total

1.	Camnula pellucida	22
2.	Melanoplus mexicanus	16
3.	Melanoplus femur-rubrum	15
4.	Melanoplus bivittatus	11
5.	Melanoplus dawsoni	7
6.	Twenty-five other species	31
	Nymphs,	0.33

MONTANA

The infestations were scattered throughout the eastern two-thirds of the State. Of the 14,481 specimens taken in the State in 1937, Melanoplus mexicanus was by far the most numerous, Aulocara ellioti was second, and Ageneotettix deorum third. There was no change between 1936 and 1937 in the five most numerous species found in the collections, except for position.

Distribution by species, of 14,481 specimens collected in Montana, expressed in percentage of total number collected in each habitat

Species	: Small	: Range:	: Rever:	: Head:	: Al-	: Mend:	: Corn:	: Weeds:	: Beets:	: Environ-:	: Mixed:	: Total	: Percent-
	: grains:	: side	: side	: side	: side	: side	: side	: side	: side	: ment	: not:	: speci-	: age of
										: shown	: onment:	: mens	: grand total
												: Number:	
Acrolophus hirtipes Say	0.02	---	0.10	---	---	---	---	---	---	---	---	2	0.02
Aerochoreutes carlinianus Thos.	04	---	---	0.07	---	---	---	---	---	---	---	---	---
Aeoloplus turnbulli Thos.	73	---	2.40	1.03	0.30	---	---	0.46	24.14	---	4.24	141	02
Aeropedellus clavatus Thos.	91	---	---	29	---	---	---	---	---	---	---	---	97
Ageneotettix deorum Scudd.	13	---	2.06	5.49	1.70	2.41	---	---	---	---	---	57	39
Amphitornus coloradus Thos.	1.51	---	0.21	2.32	0.09	---	---	---	---	1.50	50	244	6.52
Arphia pseudonietana Thos.	04	---	---	---	---	---	---	---	---	---	---	124	08
Aulocara ellioti Thos.	15.77	---	2.35	9.24	2.50	3.60	---	1.37	---	4.19	2.24	1,292	01
Boopodon nubilum Say	15	---	05	---	---	---	---	---	---	---	---	2	8.91
Brachystola magna Gir.	---	---	---	29	---	---	0.60	---	---	---	---	2	06
Bruneria brunnea Thos.	14	---	16	5.59	4.65	29.26	1.30	---	---	---	---	18	01
Camula pellucida Scudd.	1.24	---	2.43	07	---	---	---	91	---	2.99	3.23	560	12
Chloactis conspersa Harr.	---	---	---	---	---	---	---	---	---	---	---	1	3.86
Chorthippus longicornis Latr.	---	---	---	14	---	---	---	---	---	---	---	5	01
Cordillacris crenulata Em.	1.75	---	---	---	---	---	---	---	---	---	---	93	03
Cordillacris occipitalis Thos.	---	---	---	---	---	---	---	---	---	---	---	---	04
Cratypedes neglectus Thos.	60	---	03	---	---	---	---	---	---	---	---	---	23
Derotzema haydenii Thos.	04	---	03	---	---	---	---	---	---	---	---	---	03
Dissosteira carolina L.	42	---	42	1.44	13	---	---	---	---	20	25	25	46
Drepanopterna femoratum Scudd.	75	---	2.24	43	---	---	1.80	46	---	---	75	142	98
Encoptolophus sordidus costalis Scudd.	1.83	---	42	1.59	27	30	---	---	---	---	---	132	91
Hadrotettix trifasciatus Say	27	---	---	22	---	15	---	---	---	---	2.74	31	21
Hesperotettix viridis Thos.	52	---	84	22	09	---	---	46	---	---	50	57	39
Hypochlora alba Dodge	25	---	05	94	---	15	---	---	---	---	---	37	26
Melanoplus angustipennis Dodge	---	---	---	43	---	---	---	---	---	---	---	6	04
	08	---	3.65	07	72	---	1.80	---	---	---	2.24	141	97

Distribution by species of 14,481 specimens collected in Montana, expressed in percentage of total number collected in each habitat-- Continued

Species	Small	Rever-	Road-	Al-	Mead-	Corn	Weeds	Beets	Environ-	Mixed	Total	Percent-
	grains	sion	side	falfa	ow				ment	environ-	speci-	age of
									shown	ment	mens	grand total
Melanoplus bivittatus Say	0.29	3.39	0.42	3.54	2.32	7.24	8.38	---	3.45	5.99	4.24	307
Melanoplus bowditchi Scudd.	.23	.03	.26	.58	---	---	---	---	---	---	---	26
Melanoplus confusus Scudd.	.85	.24	.05	.36	---	1.21	1.80	---	---	.20	---	69
Melanoplus dawsoni Scudd.	.02	.03	---	.29	.63	---	---	---	---	---	---	13
Melanoplus differentialis Thos.	.10	---	---	---	.18	1.66	---	---	---	---	---	27
Melanoplus femur-rubrum Deg.	.85	2.77	.73	1.59	15.65	12.37	---	1.37	---	7.39	27.92	570
Melanoplus foedus fluviatilis Brun.	---	---	---	---	.09	---	---	---	---	.20	---	2
Melanoplus gladstoni Scudd.	.19	.14	.57	---	.13	---	---	---	---	---	---	27
Melanoplus infantilis Scudd.	2.24	.89	.53	1.01	---	---	.60	---	---	2.99	.25	155
Melanoplus kennicotti Scudd.	.14	---	---	---	---	---	---	---	---	---	---	7
Melanoplus mexicanus Sauss.	9.77	46.96	69.01	18.70	23.33	25.79	61.68	73.06	41.33	15.97	27.42	4,357
Melanoplus occidentalis Thos.	1.37	.14	.42	.07	.18	.30	---	---	---	.40	1.00	94
Melanoplus packardii Scudd.	1.12	4.34	4.49	3.58	4.11	2.26	11.93	4.11	---	3.19	9.97	468
Mermiria maculipennis Brun.	4.25	.58	.47	5.27	.13	.30	.50	---	---	---	---	13
Metator pardalinus Sauss.	1.39	.03	.05	---	---	---	---	---	---	---	---	346
Opeia obscura Thos.	.06	---	---	---	---	---	---	---	---	---	---	74
Orphulella pelidna Burn.	---	---	---	---	---	---	---	---	---	---	---	3
Phibostroma quadrimaculatum Thos.	3.88	.03	.21	.29	---	---	---	---	---	---	---	210
Phoetalictes nebrascensis Thos.	.12	.27	.22	.43	1.25	.45	---	---	---	---	.50	19
Spharagemon collare Scudd.	.14	.48	3.08	.43	---	---	1.80	---	---	---	.25	107
Spharagemon equale Say.	.17	.75	.37	.07	---	---	---	---	---	---	---	39
Trimerotropis campestris McN.	---	---	---	---	---	---	---	---	---	.40	---	2
Trimerotropis pallidipernis Burn.	.06	---	---	---	---	---	---	---	---	---	---	3
Trachyrhachis kiowa Thos.	2.07	.10	.16	.29	---	---	---	---	---	.20	---	118
Nymphs	29.14	22.57	3.39	30.11	40.41	6.18	6.59	17.35	---	54.09	6.48	3,491
Total specimens per environment	5,167	2,919	1,913	1,384	1,118	663	167	219	29	501	401	4,481

MONTANA

<u>Range</u>	<u>Percent</u>
1. Aulocara ellioti -----	16
2. Ageneotettix deorum -----	14
3. Melanoplus mexicanus -----	10
4. Metator pardalinus -----	5
5. Phlibostroma quadrimaculatum	4
6. Thirty-eight other species --	51
Nymphs, 29.14	

<u>Small grains</u>	
1. Melanoplus mexicanus -----	47
2. Aulocara ellioti -----	6
3. Melanoplus packardii -----	4
4. Melanoplus bivittatus -----	3
5. Melanoplus femur-rubrum -----	3
6. Twenty-eight other species --	37
Nymphs, 22.57	

<u>Reversion</u>	
1. Melanoplus mexicanus -----	69
2. Melanoplus packardii -----	4
3. Melanoplus angustipennis -----	4
4. Spharagemon collare -----	3
5. Ageneotettix deorum -----	3
6. Twenty-three other species --	17
Nymphs, 3.39	

<u>Roadside</u>	
1. Melanoplus mexicanus -----	19
2. Aulocara ellioti -----	9
3. Camnula pellucida -----	9
4. Ageneotettix deorum -----	5
5. Metator pardalinus -----	5
6. Twenty-eight other species --	53
Nymphs, 30.11	

<u>Alfalfa</u>	
1. Melanoplus mexicanus -----	23
2. Melanoplus femur-rubrum -----	16
3. Camnula pellucida -----	5
4. Melanoplus packardii -----	4
5. Aulocara ellioti -----	3
6. Seventeen other species -----	39
Nymphs, 40.41	

<u>Meadow</u>	<u>Percent</u>
1. Camnula pellucida -----	30
2. Melanoplus mexicanus -----	26
3. Melanoplus femur-rubrum -----	12
4. Aulocara ellioti -----	9
5. Melanoplus bivittatus -----	7
6. Thirteen other species -----	16
Nymphs, 6.18	

<u>Corn</u>	
1. Melanoplus mexicanus -----	62
2. Melanoplus packardii -----	12
3. Melanoplus bivittatus -----	8
4. Camnula pellucida -----	2
5. Dissosteira carolina -----	2
6. Seven other species -----	14
Nymphs, 6.59	

<u>Weeds</u>	
1. Melanoplus mexicanus -----	73
2. Melanoplus packardii -----	4
3. Aulocara ellioti -----	2
4. Melanoplus femur-rubrum -----	1
5. Camnula pellucida -----	1
6. Four other species -----	20
Nymphs, 17.35	

<u>Beets</u>	
1. Melanoplus mexicanus -----	41
2. Melanoplus differentialis --	31
3. Aeoloplus turnbulli -----	24
4. Melanoplus bivittatus -----	4
Nymphs, 0	

<u>Environment not shown</u>	
1. Melanoplus mexicanus -----	16
2. Melanoplus femur-rubrum --	7
3. Melanoplus bivittatus -----	6
4. Aulocara ellioti -----	4
5. Melanoplus packardii -----	3
6. Nine other species -----	64
Nymphs, 54.09	

MONTANA---Continued

<u>Mixed environment</u>		<u>Percentage of grand total</u>	
	<u>Percent</u>		
1. <i>Melanoplus femur-rubrum</i> -----	28	1. <i>Melanoplus mexicanus</i> -----	30
2. <i>Melanoplus mexicanus</i> -----	27	2. <i>Aulocara ellioti</i> -----	9
3. <i>Melanoplus packardii</i> -----	10	3. <i>Ageneotettix deorum</i> -----	7
4. <i>Carmula pellucida</i> -----	8	4. <i>Melanoplus femur-rubrum</i> -----	4
5. <i>Aulocara ellioti</i> -----	2	5. <i>Carmula pellucida</i> -----	4
6. Thirteen other species -----	25	6. Forty-four other species -----	46
Nymphs, 6.48		Nymphs, 24.09	

NEBRASKA

Except for the large sand-hill area in the middle of the State, there were severe infestations throughout the eastern and southern parts and threatening outbreaks in the western part. Of the 11,038 specimens collected in the State, *M. mexicanus* was the most numerous, *Cordillacris occipitalis* was second, and *M. angustipennis*, *M. differentialis*, and *M. scutellatus* next in numbers. No collections were made in 1936, but in 1935 *M. femur-rubrum* was most numerous among the specimens collected in the eastern part of the State. *Cordillacris occipitalis* did not appear in the collections that year. A second generation of *M. mexicanus* occurred in the State in 1937 and numbered from 15 to 100 per square yard. This generation damaged winter wheat so severely that a second control campaign was necessary in the fall. A large percentage of the 11,038 specimens were nymphs, probably of *M. mexicanus*.

Distribution by species of 11,083 specimens collected in Nebraska, expressed in percentage of total number collected in each habitat

Species	Creek :bottom:	Prairie :	Environment :shown:	Leg- not:unes:	Idle :land:	Range: grains:	Stall: side:	Road: :	Total :speci- :mens:	Percent- age of :grand total
<i>Aeolopus turbulli</i> Thos.	0.75	1.43	2.27	2.16	2.52	3.01	3.58	---	235	2.12
<i>Ageneotettix deorum</i> Scudd.	6.33	8.30	5.35	1.47	6.35	6.61	2.26	1.45	471	4.24
<i>Aeropedellus clavatus</i> Thos.	---	---	---	---	---	---	---	---	---	---
<i>Acrolophus hirtipes</i> Say	---	0.15	0.05	---	0.11	---	---	---	3	0.03
<i>Aulocara elliotti</i> Thos.	11.14	4.89	2.53	0.09	10.85	2.11	1.13	0.22	426	3.83
<i>Amphitornus coloratus</i> Thos.	1.36	1.19	1.13	---	.53	3.11	---	---	105	.95
<i>Erachystola magna</i> Gir.	---	---	.05	.06	---	---	---	---	3	.03
<i>Boopedon nubilum</i> Say	---	.44	---	.03	---	---	---	---	4	.04
<i>Chorthippus longicornis</i> Latr.	---	---	.09	---	---	---	---	---	2	.02
<i>Cordillacris crenulata</i> Brun.	---	.15	2.22	---	.22	1.99	---	---	59	.80
<i>Conocephalus concinnus</i> delicatum Brun.	1.20	---	---	---	---	---	---	---	8	.07
<i>Cord. occipitalis</i> Thos.	15.36	9.64	1.27	---	19.84	13.37	0.19	---	626	5.63
<i>Derotmena haydenii</i> Thos.	.30	---	.59	.90	---	---	.38	.11	48	.43
<i>Dichromorpha viridis</i> Scudd.	---	---	.05	---	---	---	---	---	1	.01
<i>Dissosteira carolina</i> L.	.30	.30	.14	---	1.00	---	.38	.22	13	.12
<i>Dissosteira longipennis</i> Thos.	---	---	.05	---	.11	---	---	---	2	.02
<i>Drepanopterna fenoratum</i> Scudd.	---	1.78	1.63	---	---	5.53	---	---	151	1.35
<i>Dactylotum pictum</i> Thos.	---	.15	.09	---	---	---	---	---	3	.03
<i>Encoptolophus sordidus costalis</i> Scudd.	---	---	---	.39	---	---	---	.11	14	.13
<i>Hadrotettix trifasciatus</i> Say	---	---	.36	.06	---	.27	---	.22	17	.15
<i>Hypochlora alba</i> Dodge	---	---	.14	---	---	---	---	---	3	.03
<i>Hesperotettix viridis</i> Thos.	.45	1.19	.32	.03	.11	.16	---	.57	40	.36
<i>Hippiscus rufescens</i> Scudd.	---	---	---	---	---	.05	---	---	1	.01
<i>Melanoplus angustipennis</i> Dodge	2.41	3.71	4.26	4.77	2.74	11.92	5.66	2.12	590	5.31
<i>Melanoplus bivittatus</i> Say	3.01	.89	7.52	4.92	1.00	.43	1.32	9.71	462	4.16
<i>Melanoplus confusus</i> Scudd.	.60	.89	.23	.12	.11	.97	.19	.22	41	.37
<i>Melanoplus differentialis</i> Thos.	1.81	6.33	6.02	7.29	5.50	---	1.13	7.25	535	4.82
<i>Melanoplus flavidus flavidus</i> Scudd.	.30	.59	1.00	.12	---	1.99	3.96	.11	91	.82
<i>Melanoplus femur-rubrum</i> Deg.	3.01	.59	5.30	5.16	.77	.05	.75	1.00	334	3.01
<i>Melanoplus foedus foedus</i> Scudd.	4.37	2.67	1.99	2.61	1.42	2.04	9.05	---	277	2.49
<i>Melanoplus foedus fluviatilis</i> Brun.	.15	---	.09	.09	.44	---	---	---	10	.09

Species	Creek bottom:	Prairie:	Environ- ment shown	Leg- umes	Idle land	: Range: grains:	: Small: road side:	Total : Percent- age of speci- mens :
Melanoplus gladstoni Scudd.	--	--	0.09	--	--	--	0.19	Number: -- : 5 : 0.05
Melanoplus keeleri luridus Dodge	--	--	.05	--	--	--	--	-- : 1 : .01
Melanoplus mexicanus Sauss.	4.52	13.79	17.62	15.21	1.50	8.77	1.88	32.63 : 4.46 : 1,350 : 12.15
Melanoplus lakinus Scudd.	--	--	.14	.24	--	--	--	-- : -- : 11 : .10
Melanoplus occidentalis Thos.	--	.74	.95	.03	--	1.86	2.79	-- : .11 : 97 : .87
Melanoplus packardii Scudd.	.15	2.52	1.68	1.65	--	.83	.81	1.32 : 1.00 : 149 : 1.34
Melanoplus regalis Dodge	--	--	.27	--	--	--	--	-- : -- : 6 : .05
Melanoplus sp.	--	2.22	--	--	--	--	--	-- : -- : 15 : .14
Mermiria maculipennis Brun.	.60	1.73	.54	.03	--	5.92	.70	-- : .22 : 98 : .88
Mermiria maculipennis racclungi Rehn.	--	--	--	--	--	--	--	-- : .22 : 2 : .02
Metator paralinus Sauss.	13.10	.30	.05	--	--	1.97	.38	.19 : -- : 116 : 1.04
Orphulella speciosa Scudd.	--	--	--	--	--	.11	--	-- : .19 : 2 : .02
Orphulella pelidna Burm.	--	--	.14	--	--	--	--	-- : -- : 3 : .03
Opeia obscura Thos.	--	3.71	.05	--	--	--	.11	-- : -- : 28 : .25
Paropomala wyomingensis Thos.	--	--	.14	--	--	.11	.54	-- : -- : 14 : .13
Phib. quadrimaculatum Thos.	.30	4.45	6.12	--	--	.33	7.46	-- : -- : 309 : 2.78
Phoetaliotes nebrascensis Thos.	--	.44	.32	.06	--	--	.21	-- : .11 : 17 : .15
Schistocerca lineata Scudd.	--	--	--	--	--	--	.05	-- : -- : 1 : .01
Spharagemon collare Scudd.	1.81	.74	1.04	.87	--	1.32	1.29	2.26 : 1.00 : 126 : 1.13
Spharagemon equale Say	.15	--	.41	.03	--	1.10	.48	.57 : -- : 33 : .30
Trachyrhachis kiowa Thos.	4.97	4.15	3.35	.06	--	3.84	3.76	-- : .11 : 243 : 2.19
Trimerotropis agrestis McN.	--	--	--	--	--	--	.11	-- : -- : 2 : .02
Trimerotropis pallidipennis Burm.	--	--	.09	--	--	--	--	-- : -- : 2 : .02
Xanthippus corallipes Hald.	--	--	--	--	--	--	.05	-- : -- : 1 : .01
Nymphs	21.23	19.72	21.61	51.12	--	25.43	19.76	32.63 : 69.30 : 3,849 : 34.64
Undetermined	--	--	--	.09	--	--	--	-- : -- : 3 : .03
Total specimens per environment	664	674	2,206	3,324	20	912	1,862	530 : 896 : 11,083 : --

NEBRASKA

Creek bottom

Percent

1.	Cordillacris occipitalis -----	15
2.	Metator pardalinus -----	13
3.	Aulocara elliotti -----	11
4.	Ageneotettix deorum -----	6
5.	Trachyrhachis kiowa -----	5
6.	Twenty-one other species -----	50
	Nymphs, 21.23	
	Undetermined, 0	

Idle land

Percent

1.	Cordillacris occipitalis -----	20
2.	Aulocara elliotti -----	11
3.	Melanoplus mexicanus -----	9
4.	Ageneotettix deorum -----	6
5.	Merniria maculipennis -----	6
6.	Twenty-three other species -----	48
	Nymphs, 25.43	
	Undetermined, 0	

Prairie

Range

1.	Melanoplus mexicanus -----	14
2.	Cord. occipitalis -----	10
3.	Ageneotettix deorum -----	8
4.	Melanoplus differentialis -----	6
5.	Aulocara elliotti -----	5
6.	Thirty-one other species -----	57
	Nymphs, 19.72	
	Undetermined, 0	

1.	Cord. occipitalis -----	13
2.	Melanoplus angustipennis -----	12
3.	Aulocara elliotti -----	8
4.	Philibostroma quadrimaculatum -----	7
5.	Ageneotettix deorum -----	7
6.	Twenty-seven other species -----	53
	Nymphs, 19.76	
	Undetermined, 0	

Environment not shown

Small grains

1.	Melanoplus mexicanus -----	18
2.	Melanoplus bivittatus -----	8
3.	Philibostroma quadrimaculatum -----	6
4.	Melanoplus differentialis -----	6
5.	Ageneotettix deorum -----	5
6.	Forty-one other species -----	57
	Nymphs, 21.61	
	Undetermined, 0	

1.	Melanoplus mexicanus -----	37
2.	Melanoplus angustipennis -----	7
3.	Melanoplus foedus foedus -----	9
4.	Melanoplus flavidus flavidus -----	4
5.	Aeolepius turnbulli -----	4
6.	Sixteen other species -----	39
	Nymphs, 32.63	
	Undetermined, 0	

Legumes

Roadside

1.	Melanoplus mexicanus -----	15
2.	Melanoplus differentialis -----	7
3.	Melanoplus femur-rubrum -----	5
4.	Melanoplus bivittatus -----	5
5.	Melanoplus angustipennis -----	5
6.	Twenty-two other species -----	63
	Nymphs, 0	
	Undetermined, 0	

1.	Melanoplus bivittatus -----	10
2.	Melanoplus differentialis -----	7
3.	Melanoplus mexicanus -----	4
4.	Melanoplus angustipennis -----	6
5.	Melanoplus flavidus flavidus -----	4
6.	Seventeen other species -----	69
	Nymphs, 69.30	
	Undetermined, 0	

Percentage of grand total

1.	Melanoplus mexicanus -----	12
2.	Cord. occipitalis -----	6
3.	Melanoplus angustipennis -----	5
4.	Melanoplus differentialis -----	5
5.	Melanoplus bivittatus -----	4
6.	Fifty-three other species -----	68
	Nymphs, 34.64	
	Undetermined, 0	

NEW MEXICO

The northeastern portion of the State was the most heavily infested, with Dissosteira longipennis as the most important species. This is not shown in the 713 specimens collected, among which Melanoplus femur-rubrum ranks first in numbers and D. longipennis second.

collected in each habitat

Species	Environment: Range	Roadside: Native	Total	Percentage of
	not shown	sod	specimens	grand total
<i>Ageneotettix deorum</i> Scudd.	---	11.51	35	4.91
<i>Arphia pseudonietana</i> Thos.	---	---	1	0.14
<i>Aulocara ellioti</i> Thos.	---	2.30	7	.98
<i>Brachystola magna</i> Gir.	---	1.32	4	.56
<i>Camula pellucida</i> Scudd.	0.75	---	3	.42
<i>Campylacantha olivacea</i> Scudd.	---	10.52	32	4.49
<i>Cordillacris crenulata</i> Brun.	---	.32	1	.14
<i>Dactylotum pictum</i> Thos.	---	.33	1	.14
<i>Deroterna haydeni</i> Thos.	---	2.96	9	1.26
<i>Dissosteira carolina</i> L.	---	.96	3	.42
<i>Dissosteira longipennis</i> Thos.	31.15	3.62	135	19.07
<i>Drepanopterna fenoratum</i> Scudd.	.25	---	1	.14
<i>Encyrtolophus sordidus</i> Brun.	1.76	27.96	92	12.90
<i>Hadrotettix trifasciatus</i> Say	.75	.99	3	.84
<i>Hesperotettix viridis</i> Thos.	---	1.32	4	.56
<i>Melanoplus bivittatus</i> Say	2.26	1.64	14	1.96
<i>Melanoplus femur-rubrum</i> Deg.	48.73	1.32	195	27.76
<i>Melanoplus foedus</i> fœdus Scudd.	3.27	4.23	25	3.65
<i>Melanoplus flavidus</i> Scudd.	---	.99	3	.42
<i>Melanoplus differentialis</i> Thos.	3.01	---	12	1.68
<i>Melanoplus gladstoni</i> Scudd.	4.02	1.32	20	2.80
<i>Melanoplus lakinus</i> Scudd.	2.01	---	9	1.26
<i>Melanoplus mexicanus</i> Sauss.	.25	2.63	9	1.26
<i>Melanoplus occidentalis</i> Thos.	---	4.93	15	2.10
<i>Melanoplus packardii</i> Scudd.	.25	---	2	.28
<i>Mermiria neomexicana</i> Thos.	---	.33	1	.14
<i>Mertiria</i> sp.	---	.65	2	.28
<i>Paraponola wyomingensis</i> Thos.	---	.33	1	.14
<i>Philib. quadrimaculatum</i> Thos.	---	.99	3	.42
<i>Spharagemon collaris</i> Scudd.	.25	3.62	12	1.68
<i>Schistocerca</i> sp.	---	.66	2	.28
<i>Schistocerca lineata</i> Scudd.	---	1.32	5	.70
<i>Schistocerca shoshone</i> Thos.	---	3.29	12	1.68
<i>Trachynachis kiowa</i> Thos.	.50	---	1	.14
<i>Trimerotropis laticincta</i> Sauss.	.25	---	3	.42
<i>Trimerotropis pallidipennis</i> Burn.	.50	---	27	3.79
Undetermined	---	7.89	---	---
Total specimens per environment	398	304	6	5
Total specimens per environment	---	---	713	---

NEW MEXICO

Environment not shown

	<u>Percent</u>
1. <i>Melanoplus femur-rubrum</i> -----	49
2. <i>Dissosteira longipennis</i> -----	31
3. <i>Melanoplus gladstoni</i> -----	4
4. <i>Melanoplus foedus foedus</i> -----	3
5. <i>Melanoplus differentialis</i> -----	3
6. Twelve other species -----	10
Undetermined adults, 0	

Roadside

	<u>Percent</u>
1. <i>Schistocerca shoshone</i> -----	33
2. <i>Schistocerca lineata</i> -----	17
3. One other species -----	50
Undetermined adults, 50	

Range

1. <i>Encoptolophus sordidus</i> -----	28
2. <i>Ageneotettix deorum</i> -----	12
3. <i>Campylacantha olivacea</i> -----	11
4. <i>Melanoplus occidentalis</i> -----	5
5. <i>Melanoplus foedus foedus</i> -----	4
6. Twenty-three other species -----	40
Undetermined adults, 3	

Native sod

1. <i>Arphia pseudonietana</i> -----	20
2. <i>Dissosteira longipennis</i> -----	20
3. <i>Melanoplus lakinus</i> -----	20
4. <i>Melanoplus packardii</i> -----	20
5. <i>Trimerotropis pallidipennis</i> -----	20

Percentage of grand total

1. <i>Melanoplus femur-rubrum</i> -----	28
2. <i>Dissosteira longipennis</i> -----	19
3. <i>Encoptolophus sordidus</i> -----	13
4. <i>Ageneotettix deorum</i> -----	5
5. <i>Campylacantha olivacea</i> -----	4
6. Thirty-two other species -----	31
Undetermined adults, 4	

NORTH DAKOTA

Of the 24,961 specimens collected in North Dakota, about 60 percent were *Melanoplus mexicanus*. *Ageneotettix deorum* Scudd. was next in numbers and *Metator pardalinus* Sauss., *Camula pellucida*, and *Melanoplus femur-rubrum* next order of abundance. The outbreaks in 1938 were composed mainly of *M. mexicanus* which hatched in enormous numbers in grain stubble, idle land, and rangeland adjacent to crops.

Distribution by species of 24,961 specimens collected in North Dakota, expressed in percentage of total number collected in each habitat

Species	: Small: Idle:	: grain: land: Range: Weeds: down: side:	: Mean: Road: Revers:	: Leg: Pas: River: Total: Percent-	: age of
Aeoloplus turnbulli bruneri Gaud.	0.12:1.66:	0.17:	0.07:	0.90:	104:
Aerocareutes carlinianus Thos.	0.12:	0.12:	0.07:	0.90:	104:
Aeropedellus clavatus Thos.	0.37:	0.37:	0.07:	0.90:	104:
Aerolophitus hirtipes Say	0.02:	0.02:	0.07:	0.90:	104:
Ageneotettix deorum Scudd.	1.82:2.02:25.49:	1.31:3.59:	3.73:	3.97:2.03:3.19:5.87:16.67:	1,891:
Amphitornus coloradus Thos.	0.04:	0.04:	0.07:	1.59:	200:
Arphia pseudonietana Thos.	0.04:	0.04:	0.07:	1.59:	200:
Aulocara elliotti Thos.	4.47:	4.47:	0.95:	0.79:	676:
Bruneria brunnea Thos.	0.37:	0.37:	0.07:	0.90:	104:
Carmula pellucida Scudd.	4.57:	4.57:	0.07:	0.90:	104:
Chorthippus longicornis Latr.	0.02:	0.02:	0.07:	0.90:	104:
Cordillacris crenulata Brun.	0.06:	0.06:	0.07:	0.90:	104:
Cordillacris occipitalis Thos.	0.13:	0.13:	0.07:	0.90:	104:
Dactyloctenium pictum Thos.	0.02:	0.02:	0.07:	0.90:	104:
Derotremes haydenii Thos.	0.04:	0.04:	0.07:	0.90:	104:
Dissoptera carolina L.	1.04:	1.04:	0.07:	0.90:	104:
Drepanopterna femoratus Scudd.	0.01:	0.01:	0.07:	0.90:	104:
Encoptolophus scirpatus costalis Scudd.	0.23:	0.23:	0.07:	0.90:	104:
Hadrotettix trifasciatus Say	0.07:	0.07:	0.07:	0.90:	104:
Hesperotettix viridis Thos.	0.09:	0.09:	0.07:	0.90:	104:
Hypochlora alba Dodge	0.01:	0.01:	0.07:	0.90:	104:
Melanoplus angustipennis Dodge	0.32:	0.32:	0.07:	0.90:	104:
Melanoplus bivittatus Say	1.30:2.02:	1.30:2.02:	0.07:	0.90:	104:
Melanoplus bowditchi Scudd.	0.01:	0.01:	0.07:	0.90:	104:
Melanoplus bruneri Scudd.	0.01:	0.01:	0.07:	0.90:	104:
Melanoplus confusus Scudd.	0.01:	0.01:	0.07:	0.90:	104:
Melanoplus dawsoni Scudd.	0.26:	0.26:	0.07:	0.90:	104:
Melanoplus differentialis Thos.	0.02:	0.02:	0.07:	0.90:	104:
Melanoplus ferrugineus Deg.	4.21:5.03:	4.21:5.03:	0.07:	0.90:	104:
Melanoplus flavidus Scudd.	0.08:	0.08:	0.07:	0.90:	104:
Melanoplus gladstoni Scudd.	0.54:	0.54:	0.07:	0.90:	104:

[illegible]

NORTH DAKOTASmall grainsPercent

1.	Melanoplus mexicanus	-----	77
2.	Camula pellucida	-----	5
3.	Melanoplus packardii	-----	4
4.	Melanoplus femur-rubrum	----	4
5.	Ageneotettix deorum	-----	2
6.	Thirty other species	-----	3
Nymphs, 0.64			

Range

1.	Ageneotettix deorum	-----	25
2.	Melanoplus mexicanus	-----	14
3.	Metator pardalinus	-----	13
4.	Aulocara ellioti	-----	10
5.	Philibetromia quadrimaculatum		5
6.	Thirty-seven other species	-----	33
Nymphs, 5.61			

Meadow

1.	Melanoplus mexicanus	-----	41
2.	Camula pellucida	-----	10
3.	Ageneotettix deorum	-----	10
4.	Melanoplus infantilis	-----	5
5.	Metator pardalinus	-----	4
6.	Twenty-seven other species	-----	30
Nymphs, 7.38			

Reversion

1.	Melanoplus mexicanus	-----	47
2.	Trachyrhachis kiowa	-----	17
3.	Camula pellucida	-----	14
4.	Ageneotettix deorum	-----	4
5.	Melanoplus packardii	-----	3
6.	Eight other species	-----	15
Nymphs, 0			

Legumes

1.	Melanoplus mexicanus	-----	72
2.	Melanoplus femur-rubrum	----	8
3.	Melanoplus bivittatus	-----	7
4.	Melanoplus packardii	-----	5
5.	Ageneotettix deorum	-----	3
6.	Five other species	-----	5
Nymphs, 0			

Idle landPercent

1.	Melanoplus mexicanus	-----	75
2.	Melanoplus packardii	-----	6
3.	Melanoplus femur-rubrum	-----	5
4.	Ageneotettix deorum	-----	2
5.	Melanoplus bivittatus	-----	2
6.	Twenty-one other species	-----	10
Nymphs, 2.22			

Weeds

1.	Melanoplus mexicanus	-----	76
2.	Melanoplus packardii	-----	7
3.	Melanoplus femur-rubrum	-----	7
4.	Ageneotettix deorum	-----	1
5.	Spharagemon collaris	-----	1
6.	Eleven other species	-----	8
Nymphs, none			

Roadside

1.	Melanoplus mexicanus	-----	65
2.	Melanoplus packardii	-----	7
3.	Metator pardalinus	-----	5
4.	Melanoplus bivittatus	-----	4
5.	Ageneotettix deorum	-----	4
6.	Twenty-three other species	-----	15
Nymphs, 1.39			

Corn

1.	Melanoplus mexicanus	-----	76
2.	Melanoplus packardii	-----	6
3.	Melanoplus femur-rubrum	-----	5
4.	Melanoplus bivittatus	-----	3
5.	Ageneotettix deorum	-----	2
6.	Nine other species	-----	8
Nymphs, 0			

Pasture

1.	Melanoplus mexicanus	-----	46
2.	Melanoplus infantilis	-----	8
3.	Camula pellucida	-----	6
4.	Ageneotettix deorum	-----	6
5.	Metator pardalinus	-----	5
6.	Nineteen other species	-----	29
Nymphs, 3.87			

<u>River bottom</u>		<u>Percentage of grand total</u>	
	<u>Percent</u>		
1. Melanoplus mexicanus -----	32	1. Melanoplus mexicanus -----	6
2. Ageneotettix deorum -----	17	2. Ageneotettix deorum -----	
3. Aulocara elliotti -----	9	3. Metator pardalinus -----	
4. Melanoplus packardii -----	9	4. Camnula pellucida -----	
5. Trachyrhachis kiowa -----	6	5. Melanoplus femur-rubrum -----	
6. Eleven other species -----	27	6. Forty-four other species -----	2
Nymphs, 0		Nymphs, 2.42	

OKLAHOMA

In Oklahoma 9,244 specimens were collected. Of these M. differentialis was by far the most numerous. The worst infestations were in the central and southwestern parts of the State.

collected in each habitat

Species	Small : Leg- : grains : une	: Pas- : ture : Corn	: Road-: River: Weedy: : Range: side : bot- : pat- : Cotton : Miscel- : Environ- : Total : Percent- : : : : : : lane- : rent not : speci- : age of : : : : : : ous : given : mens : grand total	Number:				
Acrolophitus hirtipes Say	--	--	0.23	--	0.33	--	5	0.06
Aeoloplus turnbulli bruneri Caud.	3.42	--	--	--	--	--	--	--
Aeneotettix deorum Scudd.	1.14	0.24	5.45	1.59	2.22	0.86	59	.64
Arphitornus coloradus Thos.	.10	--	--	.56	7.37	3.93	194	2.10
Arphia conspersa Scudd.	--	--	--	--	--	.44	17	.13
Arphia simplex Scudd.	--	--	--	--	--	--	1	.01
Arphia sulphurea F.	--	--	--	--	--	--	20	.22
Aulocara eliotti Thos.	12.27	.32	3.38	7.12	3.90	.89	10	.11
Boopedon maculatum Caud.	--	--	.56	--	1.01	.98	493	5.32
Boopedon nubilum Say	--	--	--	.14	--	--	16	.17
Brachystola magna Gir.	.29	--	--	.15	--	--	8	.09
Chortophaga viridi-fasciata Deg.	--	--	--	--	--	--	6	.06
Cordillacris occipitalis Thos.	--	--	--	.37	--	--	58	.63
Dactyloctenium pictum Thos.	--	--	--	--	--	.16	5	.05
Dissosteira carolina L.	--	--	--	--	--	--	3	.03
Dissosteira longipennis Thos.	.29	--	--	2.06	--	--	66	.71
Encyrtolophus pallidus subgracilis Caud.	--	--	--	--	--	--	31	.33
Eudrotettix trifasciatus Say	.10	--	--	.15	--	2.38	15	.16
Hesperotettix speciosus Scudd.	1.24	.32	3.34	7.42	3.38	.25	44	.48
Hesperotettix viridis	--	--	--	--	2.46	6.47	284	3.07
pratensis Scudd.	--	--	--	--	--	--	--	--
Hesperotettix viridis Scudd.	--	--	--	.29	--	--	30	.32
Hippiscus rugosus Scudd.	--	--	--	--	--	--	75	.81
Melanoplus angustipennis	--	--	--	--	--	--	40	.43
Dodge	10.56	2.75	2.14	15.21	15.56	14.95	898	9.70
Melanoplus arizonae Scudd.	.57	--	--	.83	--	--	41	.44
Melanoplus bispinosus Scudd.	3.14	3.83	.67	2.63	1.69	2.67	231	2.49
Melanoplus bivittatus Say	3.99	4.53	8.54	3.76	3.82	.44	391	4.22
Melanoplus bowditchi bowditchi Scudd.	--	--	--	--	5.20	3.92	--	--
Melanoplus confusus Scudd.	.10	8.74	.40	--	.73	--	122	1.32
Melanoplus confusus Scudd.	--	--	--	--	--	5.21	41	.44

Distribution by species of 9,244 specimens collected in Oklahoma, expressed in percentage of total number collected in each habitat--Continued

Species	:Small :Leg- :grains:ume	:Corn :ture	:Pas- :ture	:Range: :side:	:Road-:River:Weedy: :side:bot-:pat- :tom:ohes	:Cotton: :lane- :ous	:Miscel-:Environ-:Total :Percent- :ment not:speci-:age of
Melanoplus differentialis Thos.	14.36:40.13:60.08:14.18	:	:	8.95:21.82	0.89:29.93	16.00:	0.16 : 1,807: 19.52
Melanoplus femur-rubrum Deg.	.03	:	:	--	2.22: .37	5.72:	-- : 51: .55
Melanoplus flavidus Scudd.	--	.57	--	1.17: .14	-- : 1.59	-- :	4.28 : 124: 1.34
Melanoplus foedus foedus Scudd.	.57	--	--	.81	-- : 2.21	-- :	.16 : 51: .55
Melanoplus foedus fluviatilis Bruner	.89	1.34:12.68	:	.44	-- : 2.57	9.03:	-- : 283: 3.06
Melanoplus foedus iselyi Hebard	6.75:4.29:5.21:8.64	:	:	2.57:13.01	-- :29.19	3.17: 14.73	-- : 689: 7.44
Melanoplus glaucipes Scudd.	.95: .24: .13: .19	:	:	2.64: 1.73	-- : 6.86	.63:	-- : 124: 1.34
Melanoplus lakinus Scudd.	.95: -- : .13: .09	:	:	.51: 1.88	3.11: .12	-- :	-- : 40: .43
Melanoplus mexicanus Sauss.	7.70:15.53:11.61:3.10	:	:	1.84: 3.03	.44: 2.70	17.11:	.32 : 575: 6.21
Melanoplus occidentalis Thos.	-- : -- : -- : --	:	:	.66: .14	-- : --	-- :	-- : 10: .11
Melanoplus oklahomae Hebard	-- : -- : -- : --	:	:	--	-- : --	-- :	.16 : 1: .01
Melanoplus packardii Scudd.	11.51:16.10: .80:10.99:16.37	:	:	.87: 1.78	3.31: 8.55	1.91: .32	-- : 774: 8.36
Melanoplus ponderosus ponderosus Scudd.	-- : -- : -- : --	:	:	--	-- : --	-- :	-- : 15: .16
Melanoplus ponderosus viola Thos.	-- : -- : -- : --	:	:	--	-- : --	-- :	-- : 1: .01
Melanoplus regalis Dodge	.48	--	--	1.03	-- : 2.22	-- :	2.22 : 69: .75
Melanoplus scudderii scudderii Uhl.	-- : -- : -- : --	:	:	--	-- : --	-- :	-- : 3: .03
Melanoplus texanus Scudd.	-- : -- : -- : --	:	:	--	-- : .37	-- :	-- : 4: .04
Mermiria bivittata Serville	.08	--	.38	.22	-- : --	-- :	-- : 9: .10
Mermiria maculipennis Brun.	.81	--	2.35	1.03: 4.62	.12	-- :	-- : 106: 1.14
Metator pardalinus Sauss.	-- : -- : -- : --	:	:	.07	-- : --	-- :	.48 : 5: .05
Orphulella pelidna Burn.	.10	--	--	--	-- : --	-- :	-- : 6: .06
Orphulella speciosa Scudd.	-- : -- : -- : --	:	:	--	-- : --	-- :	-- : 1: .01
Pardalophora apiculata Harris	-- : -- : -- : --	:	:	--	-- : --	-- :	-- : 1: .01
Paratylotropidia brunneri Scudd.	-- : -- : -- : --	:	:	--	-- : .37	-- :	-- : 3: .03

Species	Small : Leg- : grains : ures	: Corn : : ture :	: Pas- : ture :	: Road- : River : Weedy : : side : bot- : pat- : Cotton :	: Miscel- : Environ- : Total : : lane- : ment not : speci- : : ous : shown : mens : grand total	Percent- : age of
Pardalophora haldemani Scudd.	--	--	0.09	0.29	0.14	0.09
Pardalophora phoenicoptera Burn.	--	--	1.22	--	0.32	0.18
Pardalophora saussurei Scudd.	--	--	0.09	0.65	2.31	0.28
Peropomala wyomingensis	--	--	--	--	--	0.01
wyomingensis Thos.	--	0.09	--	--	--	--
Philibostroma quadrimaculatum	--	--	--	--	--	--
Thos.	9.30	--	2.82	15.71	1.73	27.55
Schistocerca americana	--	--	--	3.55	0.16	0.38
americana Drury	--	--	--	--	--	0.39
Schistocerca lineata Scudd.	--	--	--	--	--	5.08
Schistocerca obscura F.	--	--	--	0.12	0.63	0.06
Spharagemon collar Scudd.	8.27	0.40	2.00	3.76	4.26	1.16
Spharagemon equale Say	10	--	--	0.07	--	--
Spharagemon superbum Hebard	--	--	--	--	--	--
Syrphula admirabilis Uhl.	--	--	--	0.12	--	0.39
Trachyrhachis kiowa fuscifrons	--	--	--	--	--	--
Stal	--	--	0.09	0.66	--	2.22
Trachyrhachis kiowa Thos.	10	--	0.09	0.07	--	--
Trimerotropis citrina Scudd.	19	57	2.67	0.28	4.62	--
Trimerotropis latifasciata	--	--	--	--	--	--
laticincta Sauss.	--	--	--	0.22	--	--
Trimerotropis pallidipennis	--	--	--	--	--	--
Burn.	19	--	--	0.12	--	1.65
Xanthippus corralipes	--	--	--	--	--	--
pantherinus Scudd.	--	0.08	0.09	0.15	--	--
Nymphs	76	--	--	0.29	--	--
Total specimens per environment	1,051	1,236	749	1,064	1,362	692
				816	631	787
					631	9,244

OKLAHOMA

Small grains

	<u>Percent</u>
1. Melanoplus differentialis	14
2. Aulocara ellioti	12
3. Melanoplus packardii	12
4. Melanoplus angustipennis	
impiger	10
5. Phlibostroma quadrimaculatum	10
6. Twenty-four other species	42
Nymphs,	0.76

Legumes

1. Melanoplus differentialis	40
2. Melanoplus packardii	16
3. Melanoplus mexicanus	16
4. Melanoplus bowditchi bowditchi	9
5. Melanoplus bivittatus	5
6. Fifteen other species	14
Nymphs,	0

Corn

1. Melanoplus differentialis	60
2. Melanoplus mexicanus	12
3. Melanoplus bivittatus	9
4. Melanoplus foedus iselyi	5
5. Hesperotettix speciosus	3
6. Twelve other species	11
Nymphs,	0

Pasture

1. Melanoplus angustipennis	
impiger	15
2. Melanoplus differentialis	14
3. Melanoplus foedus flaviatilis	13
4. Melanoplus packardii	11
5. Melanoplus foedus iselyi	9
6. Twenty-one other species	38
Nymphs,	0

Roadside

	<u>Percent</u>
1. Melanoplus differentialis	26
2. Melanoplus foedus iselyi	1
3. Melanoplus angustipennis impiger	
4. Melanoplus bispinosus	8
5. Ageneotettix deorum	
6. Twenty-one other species	38
Nymphs,	0

River bottom

1. Aulocara ellioti	4
2. Phlibostroma quadrimaculatum	28
3. Melanoplus bivittatus	
4. Ageneotettix deorum	
5. Melanoplus lakinus	
6. Thirteen other species	18
Nymphs,	0

Weedy patches

1. Melanoplus differentialis	30
2. Melanoplus foedus iselyi	20
3. Melanoplus impiger	10
4. Melanoplus glaucipes	
5. Hesperotettix speciosus	6
6. Twenty-seven other species	18
Nymphs,	0.98

Cotton

1. Melanoplus mexicanus	1
2. Melanoplus differentialis	16
3. Trimerotropis citrina	16
4. Melanoplus angustipennis	
impiger	11
5. Melanoplus bivittatus	9
6. Fifteen other species	38
Nymphs,	0

OKLAHOMA--Continued

Range

Percent

1. *Melanoplus packardii* -----16
 2. *Phlibostroma quadrimaculatum* 16
 3. *Melanoplus angustipennis*
 impiger -----11
 4. *Melanoplus differentialis* --- 9
 5. *Aulocara ellioti* ----- 7
 6. Thirty-four other species ---48.
- Nymphs, 0.29

Environment not shown

1. *Phlibostroma quadrimaculatum* 26
 2. *Aulocara ellioti* ----- 14
 3. *Melanoplus impiger* ----- 13
 4. *Hesperotettix viridis* ----- 10
 5. *Spharagemon equale* ----- 8
 6. Twenty-two other species --- 29
- Nymphs, 0

Miscellaneous

Percent

1. *Melanoplus foedus iselyi* -----15
 2. *Dissosteira carolina* ----- 8
 3. *Melanoplus flavidus* ----- 8
 4. *Chortophaga viridi-fasciata* --- 7
 5. *Melanoplus confusus* ----- 5
 6. Thirty-nine other species ----57
- Nymphs, 0

Percentage of grand total

1. *Melanoplus differentialis* ----20
 2. *Melanoplus packardii* ----- 8
 3. *Melanoplus foedus iselyi* ----- 7
 4. *Melanoplus angustipennis*
 impiger ----- 7
 5. *Phlibostroma quadrimaculatum* -- 7
 6. Sixty-six other species ----51
- Nymphs, 0.22

SOUTH DAKOTA

Of the 12,772 specimens collected in South Dakota about 46 percent were Melanoplus mexicanus. This species hatched out in 1938 in great numbers in idle land, stubble, and peppergrass prairie land adjacent to crops. One field of untenanted reverted land averaged over 1,500 per square yard on 160 acres--on which the hoppers destroyed all of the grain on 15 sections. Some of the peppergrass prairie had populations of 3,000 per square yard. Such dense populations thin out to at least 40 to 50 per square yard by the time the hoppers are adult, chiefly by spreading. Most farmers are reluctant to poison hoppers on land belonging to other people or on untenanted reverted land. They should realize that hoppers do not respect property lines any more than they do property rights. Where such places are a menace to adjacent farms poisoning them off before they get into the crops becomes a community problem.

[illegible]

431
SOUTH DAKOTA

Small grains

	<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	66
2. <i>Melanoplus bivittatus</i> -----	5
3. <i>Melanoplus packardii</i> -----	4
4. <i>Melanoplus differentialis</i> ---	4
5. <i>Ageneotettix deorum</i> -----	3
6. Twenty-eight other species ---	18
Nymphs, 3.04	

Range

	<u>Percent</u>
1. <i>Aulocara ellioti</i> -----	21
2. <i>Ageneotettix deorum</i> -----	15
3. <i>Melanoplus mexicanus</i> -----	15
4. <i>Melanoplus occidentalis</i> -----	3
5. <i>Amphitornus coloradus</i> -----	2
6. Thirty-six other species ---	44
Nymphs, 25.92	

Roadside

1. <i>Melanoplus mexicanus</i> -----	41
2. <i>Melanoplus femur-rubrum</i> -----	11
3. <i>Melanoplus packardii</i> -----	10
4. <i>Melanoplus bivittatus</i> -----	6
5. <i>Ageneotettix deorum</i> -----	3
6. Twenty-nine other species ---	29
Nymphs, 12.67	

Meadow

1. <i>Melanoplus mexicanus</i> -----	28
2. <i>Ageneotettix deorum</i> -----	27
3. <i>Melanoplus femur-rubrum</i> -----	6
4. <i>Melanoplus bivittatus</i> -----	5
5. <i>Melanoplus dawsoni</i> -----	4
6. Twenty-three other species ---	30
Nymphs, 8.74	

Pasture

1. <i>Melanoplus mexicanus</i> -----	45
2. <i>Ageneotettix deorum</i> -----	14
3. <i>Aulocara ellioti</i> -----	7
4. <i>Melanoplus femur-rubrum</i> -----	5
5. <i>Aeoloplus turnbulli</i> -----	5
6. Twenty-eight other species ---	24
Nymphs, 2.75	

Corn

1. <i>Melanoplus mexicanus</i> -----	61
2. <i>Melanoplus packardii</i> -----	8
3. <i>Melanoplus bivittatus</i> -----	8
4. <i>Melanoplus differentialis</i> ---	6
5. <i>Melanoplus lakinus</i> -----	4
6. Thirteen other species -----	13
Nymphs, 1.01	

Legumes

1. <i>Melanoplus mexicanus</i> -----	52
2. <i>Melanoplus femur-rubrum</i> -----	20
3. <i>Melanoplus bivittatus</i> -----	6
4. <i>Ageneotettix deorum</i> -----	5
5. <i>Melanoplus differentialis</i> ---	5
6. Twenty-nine other species ---	12
Nymphs, 1.80	

River bottom

1. <i>Melanoplus mexicanus</i> -----	50
2. <i>Melanoplus bivittatus</i> -----	9
3. <i>Melanoplus femur-rubrum</i> -----	7
4. <i>Melanoplus foedus fluviatilis</i>	7
5. <i>Melanoplus confusus</i> -----	6
6. Twenty other species -----	21
Nymphs, 0.23	

Weeds

1. <i>Melanoplus mexicanus</i> -----	38
2. <i>Melanoplus femur-rubrum</i> -----	24
3. <i>Aulocara ellioti</i> -----	8
4. <i>Ageneotettix deorum</i> -----	5
5. <i>Melanoplus bivittatus</i> -----	4
6. Twelve other species -----	21
Nymphs, 7.94	

Environment not given

1. <i>Melanoplus mexicanus</i> -----	49
2. <i>Melanoplus femur-rubrum</i> -----	10
3. <i>Melanoplus bivittatus</i> -----	7
4. <i>Aulocara ellioti</i> -----	5
5. <i>Mermiria maculipennis</i> -----	5
6. Twenty other species -----	24
Nymphs, 11.30	

SOUTH DAKOTA -- Continued

<u>Reversion</u>		<u>Percentage of grand total</u>	
<u>Percent</u>			
1. <i>Melanoplus mexicanus</i> -----	46	1. <i>Melanoplus mexicanus</i> -----	
2. <i>Ageneotettix deorum</i> -----	20	2. <i>Ageneotettix deorum</i> -----	
3. <i>Aulocara ellioti</i> -----	11	3. <i>Aulocara ellioti</i> -----	
4. <i>Amphitornus coloradus</i> -----	7	4. <i>Melanoplus femur-rubrum</i> -----	
5. <i>Aeoloplus turnbulli</i> -----	4	5. <i>Melanoplus bivittatus</i> -----	
6. Eleven other species -----	12	6. Fifty-two other species -----	
Nymphs, 0			

TEXAS

Only 1,005 specimens were collected in Texas. This is not a fair sample of the hoppers for the largest State in the Union; therefore the relative numbers of the different species as shown here are not conclusive. *Melanoplus differentialis* was the dominant species along the Red River and in the central part of the State. *Dissosteira longipennis* was the most numerous species found in the extreme northwestern part, or Panhandle.

in each habitat

Species	:Small:		:Road-:		:Grass-:		:Environ-:		:Total:		:Percent-	
	:grains:	:Range:	:side:	:	:land:	:ment:	:shown:	:mens:	:grand:	:total:	:age:	:of
Aeoloplus turnbulli Thos.	1.20:	--	--	:	--	--	--	:	3	:	0.30	
Ageneotettix deorum Thos.	.40:	--	0.91:	:	1.33:	--	--	:	3	:	.50	
Aulocara ellioti Thos.	14.00:	31.67:	14.16:	:	3.33:	33.43:	--	:	199	:	19.80	
Cordilacris crenulata Brun.	.80:	--	6.39:	:	--	--	--	:	16	:	1.59	
Decticinae	--	--	3.65:	:	--	--	--	:	6	:	.80	
Drepanopterna femoratum Scudd.	--	5.00:	1.37:	:	--	--	--	:	6	:	.60	
D. longipennis Thos.	--	1.67:	1.37:	:	--	1.34:	--	:	10	:	1.00	
Eneopterolophus pallidus subgracilis Caud.	.40:	--	--	:	--	.31:	--	:	2	:	.20	
Haerottettix trifasciatus Say	--	1.67:	--	:	--	1.23:	--	:	5	:	.50	
Heaper, speciosus Scudd.	--	--	--	:	2.67:	.31:	--	:	5	:	.50	
Melanoplus arizonae Scudd.	2.30:	--	.91:	:	--	1.53:	--	:	14	:	1.39	
Melanoplus bivittatus Say	2.40:	--	--	:	--	--	--	:	6	:	.60	
Melanoplus differentialis Thos.	50.40:	--	.91:	:	--	1.53:	--	:	133	:	13.23	
Melanoplus femur-rubrum Deg.	--	--	.46:	:	--	--	--	:	1	:	.10	
Melanoplus fluviatilis Brun.	--	--	--	:	--	2.45:	--	:	8	:	.80	
Melanoplus flavivittatus Scudd.	1.60:	--	--	:	--	--	--	:	4	:	.40	
Melanoplus impiger Scudd.	.80:	--	--	:	--	.31:	--	:	3	:	.30	
Melanoplus lakinus Scudd.	6.00:	1.67:	--	:	.67:	.92:	--	:	19	:	1.89	
Melanoplus mexicanus Sauss.	3.60:	5.00:	--	:	--	3.68:	--	:	22	:	2.19	
Melanoplus occidentalis Thos.	6.40:	11.67:	5.94:	:	--	--	--	:	3	:	.30	
Melanoplus packardii Scudd.	1.60:	1.67:	6.39:	:	3.33:	7.05:	--	:	59	:	5.87	
Melanoplus regalis Dodge	--	--	2.74:	:	--	3.07:	--	:	34	:	3.38	
Mermiria maculipennis Brun.	--	--	--	:	.67:	--	--	:	5	:	.60	
Mermiria sp.	--	5.00:	6.39:	:	--	--	--	:	1	:	.10	
Nymphs	--	--	1.83:	:	--	--	--	:	17	:	1.69	
Opeia obscura Thos.	--	35.00:	40.64:	:	85.32:	37.72:	--	:	4	:	.40	
Philibetostroma quadrimaculatum Thos.	2.00:	--	--	:	--	.61:	--	:	366	:	36.42	
Schistocerca lineata Scudd.	--	--	--	:	.67:	--	--	:	2	:	.20	
Syrbula admirabilis Uhl.	--	--	--	:	--	.51:	--	:	1	:	.10	
Spharagenon collaris Scudd.	.80:	--	.91:	:	--	.51:	--	:	6	:	.60	
Spharagenon equale Say	--	--	--	:	--	.51:	--	:	2	:	.20	
Trachyrhachis kiowa Thos.	4.40:	--	4.57:	:	2.00:	2.75:	--	:	33	:	3.28	
Xanthippus corallipes Hald.	.40:	--	.46:	:	--	--	--	:	2	:	.20	
Total specimens per environment	250	60	219	:	150	325	:	:	1,005	:	--	

TEXAS

Small grains

Percent

1. *Melanoplus differentialis* --- 50
2. *Aulocara ellioti* ----- 14
3. *Melanoplus packardii* ----- 6
4. *Melanoplus lakinus* ----- 6
5. *Trachyrhachis kiowa* ----- 4
6. Thirteen other species, adults 20
- Nymphs, none

Range

1. *Phlibostroma quadrimaculatum* 35
2. *Aulocara ellioti* ----- 31
3. *Melanoplus packardii* ----- 11
4. *Drepanopterna femoratum* ----- 5
5. *Melanoplus occidentalis* ----- 5
6. Five other species, adults --- 13
- Nymphs, 5.

Roadside

1. *Phlibostroma quadrimaculatum* 40
2. *Aulocara ellioti* ----- 14
3. *Melanoplus regalis* ----- 6
4. *Cordillacris crenulata* ----- 6
5. *Melanoplus packardii* ----- 5
6. Thirteen other species, adults 29
- Nymphs, 6.37

Grassland

Percent

1. *Phlibostroma quadrimaculatum* - 3
2. *Aulocara ellioti* -----
3. *Melanoplus regalis* -----
4. *Hesper. speciosus* -----
5. *Trachyrhachis kiowa* -----
6. Four other species, adults -
- Nymphs, none

Environment not shown

1. *Phlibostroma quadrimaculatum* - 3
2. *Aulocara ellioti* ----- 3
3. *Melanoplus packardii* -----
4. *Melanoplus mexicanus* -----
5. *Melanoplus regalis* -----
6. Thirteen other species, adults
- Nymphs, none

Percentage of grand total

1. *Phlibostroma quadrimaculatum* 3
2. *Aulocara ellioti* ----- 1
3. *Melanoplus differentialis* --- 1
4. *Melanoplus packardii* -----
5. *Melanoplus regalis* -----
6. Twenty-eight other species - 2
- Nymphs, 1.69

UTAH

Of the 5,669 specimens collected in Utah, *Melanoplus femur-rubrum* formed percent, with *M. mexicanus* second at 18 percent. The most severe infestations in the north-central part of the State, alfalfa fields containing the most hopi *M. femur-rubrum* increased its importance over the other species from 28 percent in 1936 to 69 percent in 1937.

Distribution by species of 5,669 specimens collected in Utah, expressed in percentage of total number collected in each habitat

Species	Leg- umes	Small grains	Pas- ture	Corn	Range	Crops	Truck	Environ- ment	Total	Percent- age of
								shown	mens	grand total
									Number	
Ageneotettix deorum Scudd.	0.14								7	0.12
Arphia pseudonietana Thos.	.59		.97						39	.59
Aulocara ellicetti Thos.	.18		.19						10	.18
Gomula pellucida Scudd.	.14		.58	20.24	7.59				28	.49
Chorthippus longicornis Latr.	.30		2.32						17	.30
Dissosteira carolina L.	.57		1.17	7.14				1.53	41	.72
Dissosteira spureata Sauss.	.10								5	.09
Drepanopterna femoratum Scudd.	.16		.39						10	.18
Hesperotettix viridis Thos.	.03								4	.07
Melanoplus bivittatus Say.	1.98		1.75	2.38	7.69			9.46	116	2.04
Melanoplus dawsoni Scudd.	.16								8	.14
Melanoplus differentialis Thos.	.04								2	.04
Melanoplus femur-rubrum Deg.	.69		70.94	53.57	36.17	23.08	93.33		3,908	63.78
Melanoplus infantilis Scudd.	.02								1	.02
Melanoplus koeleri luridus Dodge	1.03		3.90		2.13				72	1.27
Melanoplus mexicanus Sauss.	18.77		14.42	2.38	19.15	15.38		29.97	1,035	18.22
Melanoplus packardii Scudd.	3.41		3.90	2.38	6.38	15.38		50.47	228	4.01
Mermiria maculipennis Brun.	.02							3.15	3	.05
Orphulella deserteta Scudd.	.02			2.38					3	.05
Phacetalites nebrascensis Thos.	.38								22	.39
Pseudopomala brachyptera Scudd.	.02							4.73	1	.02
Schistocerca lineata Scudd.	.10		.19		36.17		6.57		24	.42
Spnargemon collare Scudd.	.02		.19	1.19					3	.05
Spharagemon equale Say	.02		.19						2	.04
Trachyrhachis kiowa Thos.	.24								12	.21
Trimerotropis pallidipennis Burm.	.59		1.17	5.95		25.08			43	.77
Trimerotropis gracilis Thos.									1	.02
Trimerotropis strenua McN.	.12				7.69				6	.11
Nymphs	.36								18	.32
Total specimens per environment	4,934	513	84	47	13	15		63	5,669	

UTAH

Legumes

Percent

1.	Melanoplus femur-rubrum ----	70
2.	Melanoplus mexicanus -----	19
3.	Melanoplus packardii -----	3
4.	Melanoplus bivittatus -----	2
5.	Melanoplus keeleri luridus -	1
6.	Twenty-two other species ----	5
	Nymphs, 0	

Small grains

1.	Melanoplus femur-rubrum ----	71
2.	Melanoplus mexicanus -----	14
3.	Melanoplus keeleri luridus -	4
4.	Melanoplus packardii -----	4
5.	Melanoplus bivittatus -----	2
6.	Nine other species -----	5
	Nymphs, 0	

Pastures

1.	Melanoplus femur-rubrum ----	54
2.	Camnula pellucida -----	20
3.	Dissosteira carolina -----	7
4.	Trimerotropis pallidipennis	6
5.	Chorthippus longicornis ----	2
6.	Five other species -----	11
	Nymphs, 0	

Corn

1.	Melanoplus femur-rubrum ----	36
2.	Schistocerca lineata -----	36
3.	Melanoplus mexicanus -----	19
4.	Melanoplus packardii -----	6
5.	Melanoplus keeleri luridus --	2
	Nymphs, 0	

Range

1.	Melanoplus femur-rubrum -----	2
2.	Trimerotropis pallidipennis --	2
3.	Melanoplus mexicanus -----	1
4.	Melanoplus packardii -----	1
5.	Camnula pellucida -----	8
6.	Two other species -----	16
	Nymphs, 0	

Truck crops

1.	Melanoplus femur-rubrum -----	97
	Schistocerca lineata -----	7
	Nymphs, 0	

Environment not given

1.	Melanoplus packardii -----	50
2.	Melanoplus mexicanus -----	30
3.	Melanoplus bivittatus -----	9
4.	Phoetaliotes nebrascensis --	5
5.	Mermiria maculipennis -----	3
6.	One other species -----	2
	Nymphs, 0	

Percentage of grand total

1.	Melanoplus femur-rubrum ----	69
2.	Melanoplus mexicanus -----	18
3.	Melanoplus packardii -----	4
4.	Melanoplus bivittatus -----	2
5.	Melanoplus keeleri luridus -	1
6.	Twenty-four other species --	6
	Nymphs, 0.32	

WISCONSIN

Only a few specimens were collected in Wisconsin in 1937. Of the 242 taken, Melanoplus mexicanus was the most numerous. This was substantiated by the hatch in 1938 which showed M. mexicanus to be dominant over a large part of the State. M. femur-rubrum was second in importance. The infestations were in threatening numbers over most of the State, except in a few central counties.

Distribution by species of 242 specimens collected in Wisconsin, expressed in percentage of total number collected in each habitat

Species	Pasture: (stump)	Meadow:	Roadside:	Total specimens:	Percentage of grand total
				Number	
<i>Camula pellucida</i> Scudd.	2.00	2.08	--	4	1.55
<i>Chort. longicornis</i> Harr.	1.00	2.08	2.17	4	1.65
<i>Melanoplus bivittatus</i> Say	--	--	2.17	1	0.41
<i>Melanoplus dawsoni</i> Scudd.	--	3.13	--	3	1.24
<i>Melanoplus femur-rubrum</i> Deg.	71.00	4.17	13.04	81	33.47
<i>Melanoplus mexicanus</i> Sauss.	26.00	53.54	52.51	149	51.57
Total specimens per environment	100	96	46	242	--

<u>Pasture (stump)</u>		<u>Roadside</u>	
	<u>Percent</u>		<u>Percent</u>
1. <i>Melanoplus femur-rubrum</i> ----	71	1. <i>Melanoplus mexicanus</i> -----	83
2. <i>Melanoplus mexicanus</i> -----	26	2. <i>Melanoplus femur-rubrum</i> ----	13
3. <i>Camula pellucida</i> -----	2	3. <i>Chort. longicornis</i> -----	2
4. <i>Chort. longicornis</i> -----	1	4. <i>Melanoplus bivittatus</i> -----	2
No other species		No other species	
 <u>Meadow</u>		 <u>Percentage of grand total</u>	
1. <i>Melanoplus mexicanus</i> -----	39	1. <i>Melanoplus mexicanus</i> -----	61
2. <i>Melanoplus femur-rubrum</i> ----	4	2. <i>Melanoplus femur-rubrum</i> ----	33
3. <i>Melanoplus dawsoni</i> -----	3	3. <i>Camula pellucida</i> -----	2
4. <i>Camula pellucida</i> -----	2	4. <i>Chort. longicornis</i> -----	2
5. <i>Chorthippus longicornis</i> ----	2	5. <i>Melanoplus dawsoni</i> -----	1
		6. One other species-----	1

WYOMING

The collections for Wyoming were the most complete of all. There were 37,628 specimens collected, of which *Melanoplus mexicanus* was first in numbers, *M. femur-rubrum* second, *M. bivittatus* third, and *Camula pellucida* fourth. Severe infestations were present in 12 counties in the northern and eastern parts of the State where most of the farming is done. There was practically no change over 1936 in the relative numbers of the first three important species. Rains in the first 2 weeks of June held outbreaks in check.

collected in each habitat																
Species	Log- umes	Small grains	Range	side	Road	ver- sion	Re- River	Mixed fields	Mead- ows	Pas- ture	Weeds and sage	Idle land	Aban- doned field	Env. not shown	Spec- imens	Percent age of grand total
Aeoloplus turnbulli Thos.	0.95	2.83	0.72	14.99	13.42	0.29	0.29	0.74	0.29	0.90	1.63	---	---	---	590	1.79
Acrolophitus hirtipes Say.	---	.04	.08	---	---	.03	---	---	---	---	.09	---	---	---	9	.02
Ageneotettix deorum Scudd.	.73	1.99	11.59	2.51	1.57	6.55	7.13	6.95	4.04	9.59	7.49	25.81	---	---	1,542	4.02
Acropedellus clavatus Thos.	---	---	.04	---	---	---	---	---	.07	---	---	---	---	---	2	.01
Arphia pseudonietana Thos.	.02	---	.02	---	---	.03	---	---	.14	---	---	---	---	---	7	.02
Aulecara elliotti Thos.	1.30	4.36	17.75	4.63	1.34	12.73	7.01	3.51	2.70	7.69	10.77	27.42	3.59	2,332	6.06	
Anabrus simplex Hald.	---	---	---	---	---	---	---	---	---	---	.09	---	---	---	1	.01
Amphitornus coloradus Thos.	.11	.49	2.21	.08	.45	1.07	.74	2.29	---	1.09	---	---	6.45	---	274	.71
Brachystola magna Gir.	.01	---	---	---	---	.05	---	---	---	---	---	---	---	---	4	.01
Bruneria brunnea Thos.	---	.04	2.20	---	---	.03	2.83	.07	---	---	---	---	---	---	167	.43
Boopeden sp.	---	.01	---	---	---	---	---	---	---	---	.45	---	---	---	6	.02
Camula pellucida Scudd.	5.97	7.65	4.95	17.41	---	7.60	12.36	21.91	45.29	9.96	.07	12.90	5.72	2,952	7.63	
Chorthippus longicornis Latr.	.17	.03	.17	.39	---	.16	1.17	1.15	.45	.54	---	---	---	---	8	.23
Cordillaeis crenulata Brun.	.01	---	1.70	.08	---	.10	---	.07	---	---	---	---	---	---	97	.25
Cratypedes neglectus Thos.	---	---	.11	---	---	.03	---	---	---	.09	---	---	---	---	8	.02
Cord. occipitalis Thos.	---	.02	2.29	1.02	---	.13	.06	---	---	---	---	---	---	---	146	.38
Derotmema maydenii Thos.	.26	.32	.89	.31	.89	.18	.49	.21	.45	.27	---	---	---	---	139	.36
Dissosteira carolinea L.	.65	.57	.06	.02	.22	.20	.12	---	---	---	---	---	---	---	136	.41
Drepanopterus femoretum Scudd.	.03	.21	4.10	.03	---	2.56	.37	1.22	2.24	.63	---	---	---	---	394	1.02
Dactyloctenium pictum Thos.	.01	---	.04	---	---	.03	---	.21	---	---	---	---	---	---	7	.02
Encyrtolophus sordidus	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ecotalis Scudd.	.07	---	.45	---	---	.66	.12	2.22	---	---	---	---	---	---	99	.26
Hadrotettix trifasciatus Say.	.14	.30	.96	1.02	.45	.62	.49	.43	---	.54	.47	4.84	---	---	160	.42
Hesperotettix viridis Thos.	.12	.26	2.12	.08	.22	.37	.37	.21	---	1.36	.83	---	---	---	190	.49
Hypochlora albo-pallens	.01	---	.04	---	---	.18	.06	---	2.69	.09	---	---	---	---	19	.05
Melanoplus angustipennis	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dodge	3.02	3.99	.36	3.34	8.59	2.44	6.46	.89	6.28	1.45	3.28	---	---	---	1,093	2.84
Melanoplus alpinus Scudd.	---	0	.13	---	---	---	---	---	---	.36	---	---	---	---	11	.03
Melanoplus bivittatus Say.	15.74	7.16	.89	6.35	6.94	12.63	14.76	12.03	1.72	4.35	1.37	---	5.03	7,310	10.17	
Melanoplus bruneri Scudd.	---	---	.55	---	---	1.07	---	.72	---	---	---	---	---	---	80	.21
Melanoplus bowditchi Scudd.	.69	.70	.96	.47	.45	---	1.76	---	.90	2.08	.47	---	---	---	267	.69
Melanoplus borealis Fowler	---	---	.06	.47	---	---	---	6.30	---	---	---	---	---	---	97	.25
Melanoplus confusus Scudd.	.05	.01	.15	.08	---	.03	---	.43	---	1.09	---	---	---	---	76	.09
Melanoplus diversus Scudd.	2.88	2.63	.25	.24	1.12	.42	.06	.64	---	.63	---	---	---	---	46	.12
Melanoplus diversus Thos.	---	---	---	---	---	---	---	---	---	.09	---	---	---	---	562	1.46

DISCUSSION BY SPECIES OF 51,626 SPECIMENS COLLECTED IN WYOMING, EXPRESSED IN PERCENTAGE OF TOTAL NUMBER COLLECTED IN EACH HABITAT--Continued

Species	:Leg-:Small :	:Rains:Range:side :	:Road-:Rever-:bot- ::	:River: ::	:Mead-:Pas-:and :Idle:done: not :Speci-: age of	:Weeds: ::	:Aban-: Env.: :Percent-
:	:umes:Grains:Range:side :	:Road-:Rever-:bot- ::	:River: ::	:Mixed :fields:ows :	:Head-:Pas-:and :Idle:done: not :Speci-: age of	:Weeds: ::	:Aban-: Env.: :Percent-
:	:umes:Grains:Range:side :	:Road-:Rever-:bot- ::	:River: ::	:Mixed :fields:ows :	:Head-:Pas-:and :Idle:done: not :Speci-: age of	:Weeds: ::	:Aban-: Env.: :Percent-
Philibetrona quadri-	:	:	:	:	:	:	:
maculatum Thos.	0.01	5.71	0.31	1.12	0.58	0.25	0.72
Photolites nebras-	:	:	:	:	:	:	:
censis Thos.	0.05	.13	.06	--	.53	--	.29
Pseudopomalo brachyptera Scudd.	0.02	.	.	--	.	.	.09
Schistocerca lineata Scudd.	--	.03	--	--	--	.06	1.29
Spharagemon collaris	:	:	:	:	:	:	:
Scudd.	.48	.13	.31	2.91	.71	1.41	--
Spharagemon equale Say	.05	.19	.39	.45	.24	.12	.07
Tettigoniidae	.03	--	--	--	--	--	--
Trachythachis kiowa	:	:	:	:	:	:	:
Thos.	.03	.09	.24	--	.63	.18	.93
Trimerotropis sparsa	:	:	:	:	:	:	:
Thos.	--	.04	--	--	.03	--	--
Trimerotropis	:	:	:	:	:	:	:
laticincta Sauss.	.01	.04	.31	--	--	.06	--
Trimerotropis	:	:	:	:	:	:	:
campestris McN.	--	--	--	--	--	--	--
Trimerotropis palli-	:	:	:	:	:	:	:
dipennis Burm.	--	.01	--	--	--	--	.09
Trimerotropis pistrinaria Sauss.	.02	.02	.03	--	--	.06	--
Trimerotropis gracilis Thos.	--	--	--	--	--	--	--
Nymphs	11.95	3.01	.91	.45	--	--	1.43
Undetermined	.01	--	--	--	--	--	1.35
Anabrus simplex Hold.	--	--	--	.22	--	--	.07
Total specimens per environment	14,224	7,704	5,268	1,274	447	3,816	1,624
						223	1,104
						427	62
						59	37,628

WYOMING

Legumes

Percent

1.	Melanoplus femur-rubrum	24
2.	Melanoplus mexicanus	23
3.	Melanoplus bivittatus	16
4.	Carmula pellucida	6
5.	Melanoplus packardii	4
6.	Thirty-nine other species	27
Nymphs, 11.95		
Undetermined adults, 0.01		

River bottom

Percent

1.	Melanoplus mexicanus	20
2.	Melanoplus femur-rubrum	17
3.	Aulocara ellioti	13
4.	Melanoplus bivittatus	13
5.	Carmula pellucida	8
6.	Forty other species	29
Nymphs, 0		
Undetermined adults, 0		

Small grains

Mixed fields

1.	Melanoplus mexicanus	42
2.	Melanoplus femur-rubrum	11
3.	Carmula pellucida	8
4.	Melanoplus bivittatus	7
5.	Melanoplus packardii	4
6.	Thirty-eight other species	28
Nymphs, 3.01		
Undetermined, 0		

1.	Melanoplus mexicanus	27
2.	Melanoplus bivittatus	15
3.	Carmula pellucida	12
4.	Aulocara ellioti	7
5.	Ageneotettix deorum	7
6.	Thirty-three other species	32
Nymphs, 0		
Undetermined, 0		

Range

Meadows

1.	Aulocara ellioti	18
2.	Melanoplus mexicanus	12
3.	Ageneotettix deorum	12
4.	Phila. quadrimaculatum	6
5.	Carmula pellucida	5
6.	Fifty-one other species	47
Nymphs, 0.91		
Undetermined adults, 0		

1.	Carmula pellucida	22
2.	Melanoplus bivittatus	12
3.	Melanoplus mexicanus	11
4.	Melanoplus femur-rubrum	9
5.	Metator pardalinus	7
6.	Thirty-seven other species	39
Nymphs, 1.43		
Undetermined adults, 0		

Roadside

Pasture

1.	Melanoplus mexicanus	21
2.	Carmula pellucida	17
3.	Acolopius turnbulli	15
4.	Melanoplus femur-rubrum	10
5.	Melanoplus bivittatus	6
6.	Thirty-four other species	31
Nymphs, 1.38		
Undetermined adults, 0		

1.	Carmula pellucida	45
2.	Melanoplus mexicanus	22
3.	Melanoplus angustipennis	6
4.	Ageneotettix deorum	4
5.	Aulocara ellioti	3
6.	Seventeen other species	20
Nymphs, 1.35		
Undetermined adults, 0		

WYOMING--(Continued)

Reversion

Weeds and Sage

	<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	32
2. <i>Melanoplus foedus foedus</i> ----	13
3. <i>Aeoloplus turnbulli</i> -----	13
4. <i>Melanoplus angustipennis</i> ----	9
5. <i>Melanoplus bivittatus</i> -----	6
6. Twenty other species -----	27
Nymphs, 0.45	
Undetermined adults, 0	

	<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	31
2. <i>Camnula pellucida</i> -----	10
3. <i>Ageneotettix deorum</i> -----	10
4. <i>Aulocara ellioti</i> -----	8
5. <i>Melanoplus femur-rubrum</i> -----	6
6. Thirty-five other species ----	35
Nymphs, 0	
Undetermined adults, 0	

Idle land

Abandoned land (fields)

1. <i>Melanoplus mexicanus</i> -----	68
2. <i>Aulocara ellioti</i> -----	11
3. <i>Ageneotettix deorum</i> -----	7
4. <i>Melanoplus packardii</i> -----	3
5. <i>Melanoplus angustipennis</i> ----	3
6. Ten other species -----	8
Nymphs, 0	
Undetermined adults, 0	

1. <i>Aulocara ellioti</i> -----	27
2. <i>Ageneotettix deorum</i> -----	26
3. <i>Camnula pellucida</i> -----	13
4. <i>Melanoplus mexicanus</i> -----	13
5. <i>Amphitornus coloradus</i> -----	6
6. Four other species -----	15
Nymphs, 0	
Undetermined adults, 0	

Environment not shown

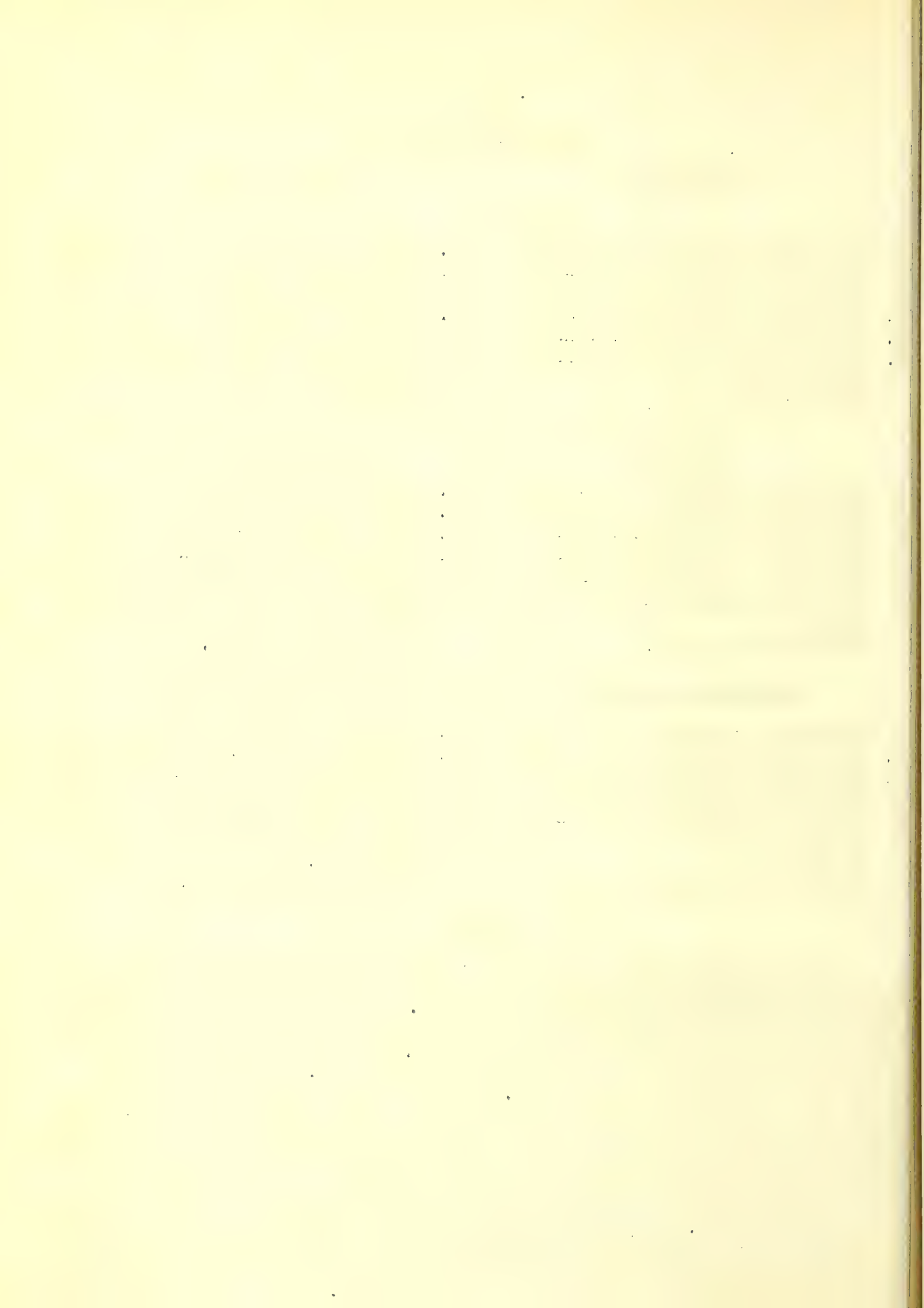
Percentage of grand total

1. <i>Melanoplus mexicanus</i> -----	80
2. <i>Camnula pellucida</i> -----	7
3. <i>Melanoplus bivittatus</i> -----	5
4. <i>Melanoplus packardii</i> -----	5
5. <i>Aulocara ellioti</i> -----	3
6. No other species	
Nymphs, 0	
Undetermined adults, 0	

1. <i>Melanoplus mexicanus</i> -----	25
2. <i>Melanoplus femur-rubrum</i> -----	14
3. <i>Melanoplus bivittatus</i> -----	10
4. <i>Camnula pellucida</i> -----	8
5. <i>Ageneotettix deorum</i> -----	4
6. Sixty-eight other species ----	39
Nymphs, 5.35	
Undetermined adults, .01	

SUMMARY

The most spectacular event of the 1937 outbreak was the infestation of *Dissosteira longipennis* in Colorado, New Mexico, and Texas. The most interesting from an entomological standpoint was the second generation of *Melanoplus mexicanus*, which began hatching about August 20 and actually produced a second outbreak of hoppers in the winter-wheat sections. This species has steadily advanced in its importance over other species since 1933. There are, however, fairly well defined areas where certain species are dominant. *Melanoplus femur-rubrum* is now dominant in the areas comprising northeastern Iowa, south-eastern Minnesota, southern Wisconsin, northern Illinois, Idaho, and Utah. *M. differentialis* is dominant or very important in southern Iowa, northern Missouri, eastern Kansas, eastern Nebraska and most of Oklahoma and Texas. *M. mexicanus* is the most important species in the Dakotas, western Nebraska, Kansas, and most of Montana and Wyoming. *Dissosteira longipennis* is by far the dominant species in the northeastern counties of New Mexico, the Western Panhandle of Texas, the Panhandle of Oklahoma, and southeastern counties of Colorado. *Camnula pellucida* was of local importance in the States farthest north.



THE MORE IMPORTANT RECORDS FOR AUGUST

The grasshopper situation remained unchanged during August. Severe damage was done in a number of places in the Plains States, and heavy migrations into the Red River Valley of North Dakota may lead to trouble in that region next years.

Heavy damage to sod and pastures by white grubs was reported from northern New England and New York. These insects are reported from Virginia and Tennessee attacking strawberries.

The Japanese beetle was excessively abundant at a number of points in the regions that had become infested within the last few years.

The Asiatic garden beetle attracted considerable attention in the vicinity of the District of Columbia.

An introduced weevil, Calomycterus setarius Roelofs, was reported for the first time from Massachusetts during the month. It has also been found in the vicinity of Philadelphia.

Serious armyworm damage was reported from New England, the Middle Atlantic States, southward to Virginia, and also from Minnesota, Oklahoma, and Texas.

The fall armyworm became troublesome in the corn cannery sections of Maine, and a heavy infestation of this insect occurred in Maryland in the vicinity of Washington, D. C., where it was damaging corn. Similar reports of damage to corn were received from Virginia, North Carolina, Georgia, and the Gulf region, with scattered infestations reported from Indiana southward through Missouri and Kansas to Texas.

The corn ear worm is more generally distributed in Maine than it has been for many years. Otherwise this insect is about normally abundant throughout the greater part of the country, although rather heavy outbreaks on both corn and cotton are reported from the Gulf region.

Serious damage by second-brood European corn borer is expected in Massachusetts, Connecticut, New York, New Jersey, Ohio, and Indiana. Unusually large numbers of eggs were observed during August. In the latter State this insect occasioned commercial damage for the first time since it has been known to occur in that State.

The hessian fly situation in general does not seem to be serious.

The lesser cornstalk borer was unusually abundant in the South Atlantic and Gulf States.

Chinch bug showed a marked increase in scattered areas in Iowa, Missouri, and Oklahoma.

The corn leaf aphid was destructively abundant in North Carolina with numerous reports from Ohio westward to Nebraska.

Second-brood codling moth was generally reported as moderately abundant, or scarce, throughout the Eastern States. In Washington State this insect increased in numbers rapidly during August and a heavy third brood is expected.

Throughout the New England and Middle Atlantic States the European red mite was rather abundant.

The second generation of plum curculio was more abundant than usual in the Fort Valley section of Georgia.

Oriental fruit moth was abnormally abundant in the southern New England, Middle Atlantic, and South Atlantic States, reports of infestations also being received from Mississippi and Ohio.

The walnut caterpillar defoliated many walnuts in the southern New England and Middle Atlantic States, westward to Michigan and Missouri.

The yellow-necked caterpillar was reported attacking apples from Connecticut through Pennsylvania to Illinois, Missouri, and northward to Minnesota.

The tarnished plant bug attacking various truck crops was reported from Vermont and New York.

A serious infestation of the salt-marsh caterpillar in truck gardens occurred in central Maine.

The tomato psyllid did considerable damage in Colorado, Montana, and Utah.

Mexican bean beetle continued to spread northeastward in Maine, and in New York State this insect occasioned serious injury. Similar heavy infestations of beans were reported from New Jersey, southward to Florida, and westward to Tennessee, Ohio, Indiana, Missouri, and Mississippi.

Pepper weevil occasioned from heavy to very heavy damage in southern California.

Boll weevil extremely numerous throughout the Cotton Belt, and doing serious damage to top and late-planted cotton.

Cotton leaf worm increasing rapidly and in many cases doing considerable ragging of cotton, and in southern Texas serious damage.

Bollworm damaging cotton from Georgia southward and around the Gulf region through Texas and Arizona with serious damage in many places.

Pink bollworm has been found in Kleberg, Nueces, and Brooks Counties, Tex. Five new counties have been placed under quarantine.

Leaf aphids are unusually abundant throughout the entire Cotton Belt, being particularly numerous in areas where dusting has been carried on.

The fall webworm was generally abundant throughout New England, Middle Atlantic, and South Atlantic States, westward to Ohio and Tennessee, and around the Gulf to Texas.

The forest tent caterpillar in New England and New York has seriously injured large numbers of red oaks and maples, this being the third year that heavy infestations occurred in that region.

Gypsy moth infestations are generally less severe than they were last year in the New England area.

Elm leaf beetle very abundant throughout New England and New York, with reports of local damage southward to Virginia and in the Ohio River Valley.

A serious outbreak of the southern pine beetle is occurring from southern Maryland to eastern North Carolina.

Quite a little damage has occurred to lawns in Connecticut, New York, and Pennsylvania by the hairy chinch bug. Similar damage by Blissus insularis Barber was reported from Florida.

Very heavy outbreaks of mosquitoes were reported from Connecticut, Massachusetts, and New Jersey.

Thirty-three cases of Rocky Mountain spotted fever, with eleven deaths, have been reported so far this year from Maryland. Seventeen cases of this disease were reported the first two weeks in August from Virginia.

Penthaleus major Duges, a mite, which attacks peas in Australia is recorded from California in this number of the Survey Bulletin.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

Ohio. T. H. Parks (August 20): Although no more than normally abundant, grasshoppers are sufficiently numerous in a few localities to require control. Ripening peaches and corn were injured in central Ohio.

Kentucky. W. A. Price (August 24): Extremely abundant in August in low-land pastures in the vicinity of Lexington. Melanoplus femur-rubrum Deg. apparently the most common species.

Indiana. J. J. Davis (August 24): Isolated destructive but not extensive infestations in all parts of the State. Perhaps the greatest damage done to hybrid corn.

G. E. Gould (August 25): Abundant in many fields in the northern part of the State. Damage observed to carrot tops and carrots adjoining an uncultivated field.

Illinois. W. P. Flint (August 24): A decided decrease throughout the entire season. Now present in normal or subnormal numbers in most sections of the State.

Missouri. L. Haseman (August 24): Situation throughout the State about the same as a month ago. In northern Missouri some reports have come in of a partial second generation of the lesser migratory grasshopper (Melanoplus mexicanus Sauss.). At Columbia most of the eggs have already been deposited by the two-striped species (M. bivittatus Say) and the most abundant species still active is the differential grasshopper (M. differentialis Thos.). Hoppers decidedly less abundant than a year ago.

Minnesota. A. G. Ruggles and assistants (August): Grasshoppers from moderately abundant to very abundant throughout the State.

North Dakota. J. A. Munro (August 27): Grasshoppers moving around a great deal. Much of the Red River Valley, practically devoid of grasshoppers earlier in the season, is now overrun with them. In Walsh County, northeastern North Dakota, severe damage has been caused, especially to potatoes. Vines stripped in most fields so that nothing remained but the bare stalks of the plants. Egg laying well under way. In fields at Park River, Walsh County, egg pods of M. mexicanus occur at the rate of one per square foot, but along the margins the rate is a little higher.

Nebraska. M. H. Swenk (August 23): Caused serious general crop damage from July 21 to August 20. Specimens received from Deuel County on August 3 showed infestation by red mites Eutrombidium trigonum Hermann.

Kansas. H. R. Bryson (August 25): State as a whole remarkably free from serious grasshopper injury. In Clay, Riley, Cloud, and Jewell Counties, north-central Kansas, several cornfields have been damaged noticeably by grasshoppers but most of the fields are weedy.

Colorado. C. R. Jones (August 1): In most places the adult stage and the migratory forms can be seen in the air during the day.

Montana. H. B. Mills (August 20): A large migration of M. mexicanus invaded the eastern part of the State from the southeast on July 1. In the area bounded by Blaine, Petroleum, Musselshell, Treasure, Rosebud, and Powder River Counties, numbers of eggs now being laid in areas which were relatively free from hoppers prior to the migration. M. differentialis noted to be abundant and injurious along the Yellowstone Valley, from Sidney to Miles City. Brachystola magna Gir. and Dactylotum pictum Thos. reported from Valley County.

Utah. G. F. Knowlton (August 22): Control measures giving very good results in most cases. Farmers generally are applying them vigorously to save their alfalfa-seed and hay crops. M. mexicanus, M. femur-rubrum, M. packardii Scudd., and M. bivittatus are the species most commonly present in injurious numbers. Migrations from range to crop land somewhat later than usual this year owing to forage remaining green longer than usual on the range. Sarcophaga kellyi Ald. noted on August 1 as abundant and parasitizing grasshoppers in large numbers at Wilson's Mesa, Grand County.

MORMON CRICKET (Anabrus simplex Hald.)

Nebraska. M. H. Swenk (August 23): Infestation at Oshkosh, Garden County, continued to be commented on as late as the middle of August.

Utah. C. J. Sorenson (August 22): Scattered bands of varying sizes are ovipositing in the following areas: Juab County--West Tintic Mountains, west of Eureka; Millard County--Canyon Mountains, north-west of Scipio; Tooele County--Boulter Pass, Lofgreen, and Benmore districts and Hickman, Canyon district. A few scattered bands appeared in grainfields on August 6. In Sanpete County, northwestern Fountain Green area, there are a few crickets in alfalfa fields, also in the foothills and mountains to the westward.

FIELD CRICKET (Gryllus assimilis F.)

North Dakota. J. A. Munro (August 27): Abundant and causing severe injury to flax, alfalfa, and other crops in Richland County, southeastern North Dakota. Heavy damage done to some fields of alfalfa.

CUTWORMS (Noctuidae)

New York. N. Y. State Coll. Agr. News Letter (August 8): On Long Island the variegated cutworm (Lycophotia margaritosa saucia Hbn.), recently very abundant in some potato fields, has been almost eliminated because of parasitization by tachinid flies.

Georgia. O. I. Snapp (July 14): Cowpea plants in fields at Fort Valley, central Georgia, have been injured by a heavy infestation of cutworms.

WEBWORMS (Loxostege spp.)

Indiana. J. J. Davis (August 24): Report on August 20 of the garden, or alfalfa, webworm (L. similalis Guen.) as appearing in destructive numbers in alfalfa fields in Lagrange County, in the extreme northern part of the State.

Montana. H. B. Mills (August 20): First-generation sugar beet webworms (L. sticticalis L.) reported as damaging sugar beets and garden truck considerably in the western half of the State. Damage reported as far east as Phillips, Fergus, and Park Counties.

Utah. G. F. Knowlton (August 3): Moths of the sugar beet webworm came to light traps in northern Utah throughout July, heavy flights to the Syracuse trap light occurring from July 20 to 28. Larvae are abundant on Russian-thistle at Panguitch, Garfield County, southwestern Utah.

VELVETBEAN CATERPILLAR (Anticarsia gemmatilis Hbn.)

Louisiana. C. O. Eddy (August): This caterpillar present throughout the State, the most severe damage being confined to central and northern Louisiana, where seed crops are grown. Velvetbeans in southern Louisiana being plowed under rapidly.

WIREWORMS (Elateridae)

Kentucky. W. A. Price (August 24): Ripening tomatoes in the vicinity of Lexington are being injured considerably where fruit is in contact with the soil. The species involved is probably Aeolus dorsalis Say.

WHITE GRUBS (Phyllophaga spp.)

Maine. J. H. Hawkins (August 16): Many acres of timothy grass totally destroyed in Oxford County, southwestern Maine. Reseeding necessary in many places to maintain a stand of grass for hay and pasture. Wet places apparently affected the worst. Beets and carrots also attacked.

New York. N. Y. State Coll. Agr. News Letter (August 22): Damage in sod and pastures apparent in several sections of the State. Large areas in Steuben and Schuyler Counties are heavily infested, a brief survey on August 20 and 21 showing much injury. In some instances the dead turf can be rolled up like a carpet. Similar injury reported from sections of the Champlain Valley. Strawberries, beans, corn, and other cultivated crops on grub-infested land show injury.

Virginia. H. G. Walker (August): Reported as seriously injuring a field of strawberries near Greatbridge, Norfolk County.

Tennessee. G. M. Bentley (August 23): Reported on August 10 as very numerous in strawberry patches in Hamilton County, and as doing considerable damage to the plants.

Iowa. C. J. Drake (August 22): White grubs, Brood C, causing injury in truck fields near Council Bluffs, Pottawattamie County, western Iowa.

Utah. G. F. Knowlton (August 11): Damaging potato tubers at Panguitch, Garfield County, and Morgan and vicinity, in Morgan County, north-central Utah.

GREEN JUNE BEETLE (Cotinis nitida L.)

Kentucky. W. A. Price (August 24): Considerable damage caused to peach and nectarine fruits the latter part of July and the first week of August in the vicinity of Lexington.

Louisiana. C. O. Eddy (August): Beetles still flying abundantly.

W. E. Anderson (August 23): Fig-eater unusually numerous in the State.

JAPANESE BEETLE(Popillia japonica Newm.)

General. E. G. Brewer (August): Active flight of the beetle under way in most of the heavily infested sections by July 4. Swarming reduced late in July by heavy rains. Considerable reduction in the population at Richmond, Va., by the end of July, as well as in the District of Columbia, where only the eastern section remains heavily infested. A heavier infestation than in previous seasons reported around the railroad yards at Alexandria, Va. Beetle flight in Baltimore, Md., the heaviest in recent years. Beetles captured in nearly all traps set at College Park, Md., possibly indicating that infestations in District of Columbia and at Laurel, Md., have merged at College Park. Beetles numerous around Chester, Pa., coinciding with heavy flight noted between Wilmington and Dover, Del., but fewer beetles noted in Philadelphia than were observed last year. Heavy infestations were noted, however, in West Grove, Avondale, Kennett Square, Radnor, Hatboro, Newton, Willow Grove, Ambler, and Doylestown, Pa. Heaviest infestation ever observed at West Grove, Pa. At the peak of infestation at Norwood, Pa., from July 15 to 17, clusters of 75 or more beetles on rose blooms were quite common. Complete defoliation noted on cherry, elder, sassafras, primrose, morning-glory, and many roses. Chinese elms sprayed at Harrisburg, Pa. Some of the heaviest orchard defoliations in New Jersey occurred in Hunterdon County. An increase in beetle population indicated by reports from points in New England, such as New London, Conn., Springfield, Mass. and Brewer, Maine.

Connecticut. J. P. Johnson (August 22): Beetles abundant at Bridgeport, New Haven, Stamford, Greenwich, Hartford, New London, and Danbury until the second week in August, when the numbers began to decrease. A large infestation in East Hartford was stripping willow, sweet cherry, and plum, and feeding considerably on apple and elm. This infestation was centered along the river meadow land.

New York. M. Kisliuk, Jr. (August 15): Estimated that this beetle was twice as abundant this year as last during the flight season late in July and early in August. Serious local damage to many crops.

N. Y. State Coll. Agr. News Letter (August 8): Japanese beetles at the height of their destruction in the heaviest infestation ever observed in Westchester County. More in evidence in the northern end of the county in new areas, where they emerged 10 days later than in the southern end of the county. Forests being attacked where there is a variety of foliage. Little doubt that Japanese beetles are more numerous in Monroe County, western New York, this year than heretofore.

Delaware. E. P. Felt (August 23): Reported as excessively abundant and injurious in the vicinity of Wilmington.

Ohio. G. A. Runner (August 23): One specimen taken in a trap at Sandusky on August 19. This is the first record of the Japanese beetle in this area.

ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

New York. N. Y. State Coll. Agr. News Letter (August 8): Beetles have defoliated carrots in a few fields on Long Island where they have been causing a great deal of damage on a variety of vegetables.

District of Columbia. I. Smith (August 19): Asiatic garden beetle very destructive in a number of flower gardens in the northwestern section of Washington. Among the plants most seriously affected are chrysanthemum, Shasta daisy, bergamot, rose, zinnia, and phlox. (Det. by E. A. Chapin.)

M. Harriet Foster (August 4): Adults collected at night, feeding on flower-garden plants in the northeastern part of Washington on August 2. (Det. by E. A. Chapin.)

FULLER'S ROSE BEETLE (Pantomorus godmani Crotch)

Virginia. H. G. Walker (August 20): Larvae are feeding on the base of azalea bushes, barking them below the surface of the ground. They practically ruined four beds of azaleas in a nursery near Norfolk. (Det. by A. Boving.) Larvae and pupae were found in the soil under an elm tree near Norfolk. The larvae apparently had been feeding on the roots of the tree, as there was very little other vegetation.

South Carolina. O. L. Cartwright (July): Local outbreak at Westminster of Fuller's rose beetle on flowers and other plants.

Florida. A. N. Tissot (August 23): The beetle continues to be abundant in two tung-oil groves near Gainesville. Egg laying now going on rapidly, the eggs being deposited principally under the old bud scales. This insect also reported as doing considerable damage in a citrus nursery in Lakeland.

Louisiana. W. E. Anderson (August 23): Unusually numerous in the State.

A WEEVIL (Calomycterus setarius Roelofs)

Massachusetts. A. I. Bourne (August 26): Collected from a nursery in Holyoke, on the Connecticut River. The weevil was found indoors on wax begonia, kalanchoe, ivy, and chrysanthemum, and out of doors on one of the native poplars. Doing most damage to begonia. (Det. by L. L. Buchanan.)

Pennsylvania. L. J. Bottimer (August): Examples of this species received from H. P. Hopper, who collected them in Philadelphia on July 4.

COMMON RED SPIDER (Tetranychus telarius L.)

Massachusetts. A. I. Bourne (August 24): An unusual number of complaints of mites, or red spider, particularly on evergreens, received. This is somewhat surprising, considering the frequent heavy rains.

Pennsylvania. H. E. Hodgkiss (August 25): Reported as causing damage in various places.

Indiana. J. J. Davis (August 24): Rather abundant on some trees, such as soft maple and oak, causing leaves to whiten and, in the case of maple, sometimes to drop. Perennials, such as phlox, also heavily infested. Infestations rather general but more inquiries from the northern half of the State.

Michigan. R. Hutson (August 22): Two-spotted mite very common during July and August on all sorts of fruit trees, reported from Jonesville, Cassopolis, St. Joseph, Stevensville, Paw Paw, South Haven, Grand Rapids, Lansing, Farmington, and Mount Clemens.

Arkansas. D. Isely (August 22): Severe local injury to cotton has occurred throughout the Delta, northeastern Arkansas.

Kansas. H. R. Bryson (August 25): Causing considerable injury to elm trees. Abundant on late beans, garden flowers, and some varieties of weeds.

California. Exch. Pest Control Circ. (August): Red spiders more or less persistent during the summer, especially in the interior areas, where considerable treatment has been necessary. The recent hot spell has checked the pest to some degree but not sufficiently to eliminate the possibility of another early build-up.

CEREAL AND FORAGE - CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

ARMYWORM (*Cirphis unipuncta* Haw.)

- Maine. J. H. Hawkins (August 16): Corn, oats, barley, and timothy attacked by armyworms generally throughout Maine. Nearly all infestations in fields planted to oats and peas early last spring. No infestation noted in fields cultivated during June and July except where armyworms had dispersed from other centers of infestation. Apparently a remarkable absence of parasites and diseases.
- Vermont. H. L. Bailey (August 27): Most of the July brood were pupating the last week in July; larvae of subsequent brood not reported up to August 26. Considerable number of adults at Guildhall, in Essex County, northeastern Vermont, on August 19. Heaviest infestation of July brood in the Connecticut River Valley and Rutland County, but scattering outbreaks reported in all counties except Grand Isle.
- Massachusetts. A. I. Bourne (August 24): General and serious abundance of armyworms throughout much of Middlesex and Worcester Counties, central Massachusetts during the last week of July. Also isolated cases of abundance throughout the southeastern section of the State. Grass and other cover crops in orchards seriously damaged. A field of 7 acres of oats was ruined in 1 day at Brookfield. A 2-acre field of oats in Worcester County completely ruined. Not only the crop of oats but also the cover crops were devoured thus ruining prospects for next year's crop. Wilt disease and dipterous parasites abundant.
- Connecticut. N. Turner (August 22): Serious damage to young sweet corn, especially tassels, in New Haven County at Mount Carmel and Branford.
- New York. N. Y. State Coll. Agr. News Letter (August 1): The outbreak in the 20 known infested counties has subsided. Worms are heavily parasitized.
- Virginia. H. G. Walker (August): Moths have been rather abundant at lights.
- Minnesota. A. G. Ruggles (August): Armyworms abundant in some northwestern counties. Comparatively few parasites.
- Oklahoma. F. A. Fenton (August 20): Armyworm at Ponca City, Kay County, in the north-central part of the State.
- Texas. R. K. Fletcher (August 22): Doing considerable damage to Sudan grass in Presidio County, southwestern Texas. A heavy infestation on wheat and oats in Denton County, northeastern Texas, suddenly stopped by a small parasite.

HESSIAN FLY (Phytophaga destructor Say)

Michigan. R. Hutson (August 22): Light infestations in St. Joseph, Branch, and Calhoun Counties, southern part of the State on July 28.

Missouri. L. Haseman (August 24): There are not enough flaxseeds in the wheat stubble to cause serious alarm in any part of the State, though in spotted areas throughout the southern half of the State trouble is more likely to appear.

WHEAT STEM MAGGOT (Meromyza americana Fitch)

Texas. P. B. Dunkle (August 22): An exceptionally heavy infestation is occurring in Denton County where fully 50 percent of the culms are infested.

CORN

CORN EAR WORM (Heliothis obsoleta F.)

Maine. J. H. Hawkins (August 16): Usually confined to the coastal area of southwestern Maine, but now found over the greater sweet corn section of the State, including Orono.

New York. N. Y. State Coll. Agr. News Letter (August 22): Infestations in the Long Island area still extremely light. Examination of 100 plants in each of 9 fields shows an average infestation of only 11 percent, the infestations ranging from 0 to 28 percent.

South Carolina. W. C. Nettles (August 22): Damage is serious on late-planted corn.

Ohio. G. A. Runner (August 23): More than the usual abundance on sweet corn.

Indiana. E. V. Walter (August 23): Infestation in both sweet and dent corn lighter than usual.

Illinois. R. A. Blanchard (August 29): Observed to be abundant in dent corn in southern Illinois by late August. Infestation in central Illinois light at that time. Cannery corn in the Hoopston area only lightly infested by August 19. Development of the insect apparently favored by the dry weather in parts of southern Illinois, whereas the abundance of rain in central Illinois has resulted in a low infestation.

Kentucky. W. A. Price (August 24): Infestations range up to 80 percent in some plantings of sweet corn in the vicinity of Lexington.

Mississippi. C. Lyle (August 24): Cotton bolls showing slight injury received recently from Jefferson Davis, Jones, and Pike Counties, south-central and southwestern Mississippi. Infestations in east-central Mississippi reported on August 22. Damage to corn and slight injury to cotton observed in southwestern Mississippi on August 20.

Louisiana. C. O. Eddy (August): Corn ear worm unusually abundant in ears and buds of young corn.

Missouri. L. Haseman (August 24): Field corn over the State showed very little infestation during the first 3 weeks in August. Increase indicated during the latter part of the month and moths now fairly abundant at Columbia.

Oklahoma. F. A. Fenton (August 20): Corn ear worm at Blackwell, Kay County.

Texas. R. K. Fletcher (August 22): Seriously injuring the heads of grain sorghums in some places in Brazos and Burleson Counties, east-central Texas.

Utah. G. F. Knowlton (August 1): Damaging 35 percent of the sweet corn examined at Willard, north-central Utah, and 85 percent of the ears examined at Moab, in the southeastern part of the State.

H. E. Dorst (August 23): Only about 35 percent of early and midseason sweet corn infested. Midseason corn showed only small larvae when corn was ready for market. Silking of the corn must not have synchronized with the peak of flight of the moths. Only an occasional larva observed in tomato fruits. Infestation very light to date.

FALL ARMYWORM (Laphygma frugiperda S. & A.)

Maine. J. H. Hawkins (August 16): Isolated instances found in sweet corn in the vicinity of Orono, Penobscot County.

Maryland. L. P. Ditman (August 23): An unusually heavy infestation in the neighborhood of College Park, damaging the curl of young corn, both sweet and field.

Virginia. C. G. Poole (August 12): Larvae are boring into and seriously injuring buds of late corn at Virgilina, in south-central Virginia. (Det. by C. Heinrich.)

H. G. Walker (August): Quite destructive to late plantings of field and sweet corn near Norfolk and on the Eastern Shore.

North Carolina. W. A. Shands (August 12): Considerable injury on late corn noted in the vicinity of Oxford, north-central part of the State.

Georgia. T. L. Bissell (August 1): Fall armyworms about two-thirds grown received from Zebulon, central Georgia. This is the first record for the year of damage by this insect. (August 22): A few worms seen this month at Experiment on cowpeas and in corn ears.

Mississippi. C. Lyle (August 24): Reported as causing considerable damage to corn in various sections of Mississippi during the last month. A 45-acre field in Monroe County, northeastern Mississippi, heavily damaged. Unusually severe damage reported on a number of farms in

Wayne County, southeastern Mississippi. Infestation stated to be general in the vicinity of Grenada, north-central Mississippi.

Louisiana. L. O. Ellis and E. H. Floyd (August): Very abundant on young soybeans at Baton Rouge, doing considerable injury to the foliage; also feeding on a native grass.

Indiana. E. V. Walter (August 23): A field of corn at Shelbyville, southeastern Indiana, observed on August 18 to be badly damaged.

G. E. Gould (August 25): Found on August 18 on late sweet corn at La Fayette.

Missouri. L. Haseman (August 24): Late sweet corn and late field corn found to be attacked August 15 in various sections of the State, extending from the southeast through west-central, central, and northeastern Missouri. Apparently destructive in scattered patches over the fields or in gardens. Maturing and pupating on August 24.

Kansas. H. R. Bryson (August 25): Abundant and causing injury to corn in the eastern part of the State. Most severe damage reported from Chapman, where a 40-acre field of late corn is heavily infested. Another report of injury received from Arkansas City.

Texas. W. S. McGregor (August 22): Reported on corn in Dickens County, northwestern Texas.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

New Hampshire. J. G. Conklin (August 29): Unusually destructive in southern New Hampshire this season. Present in moderate numbers as far north as North Conway.

Massachusetts. A. I. Bourne (August 24): Second brood just now becoming conspicuous. First brood considerably heavier than usual, particularly in the southern part of the Connecticut Valley region. In usual abundance elsewhere. Second-brood larvae observed rather earlier this year and found in large numbers the last of July and the first week of August. Indications from examination of fields during the egg-laying period and at present point to very great increase over last year's attack, particularly in the Connecticut Valley section of western Massachusetts. Also in Worcester County.

Connecticut. N. Turner (August 22): Second-generation eggs and larvae present. Infestation in late potatoes unusually heavy in some fields in Tolland County. Many reports of larval injury to dahlias, asters, and marigolds.

New York. N. Y. State Coll. Agr. News Letter (August 8): In eastern New York examination of dahlia plants in a 1-acre planting near Huntington showed the crowns of about 10 percent of the plants to be infested with first-instar larvae. (August 22): Infestations greatly increased,

particularly in corn ears. Examination of 100 ears in each of 5 fields shows an average infestation in ears of 42 percent, ranging from 32 to 49 percent. Dissection of 200 plants, which reached maturity 2 weeks ago, shows about 1 borer for every 2 plants. Dissection of only 20 plants from which corn is now being picked gave an average infestation of 5 borers per plant. About 90 percent of the individuals are in the larval stage, 9 percent in the pupal stage, and 1 percent emerged, as indicated by cast pupal skins. Younger plantings, not yet beginning to silk, show an average infestation of 48 percent, ranging from 17 to 64 percent. (August 15): In western New York a limited number of reports, indicating that damage is on the increase in Wayne County.

New Jersey. C. A. Clark (August 22): A very severe infestation in late corn developing in central New Jersey. Infestation in some fields will average over 30 borers per plant, with every plant infested. Corn in some fields is badly broken down. Infestation around Hightstown as bad as in the Allentown district in 1936. In the latter district corn growing has been practically abandoned.

E. Kostal (August 15): Heaviest infestation at Morganville, Monmouth County, since the insect was introduced into this area. Reported that young raspberry shoots are infested in some fields.

Ohio. T. H. Parks (August 20): Has made a spectacular increase in most parts of northwestern Ohio. Injury to sweet corn near Toledo severe, while complaints, accompanied by specimens, were sent in from as far south as Delaware County, central Ohio.

Indiana. J. J. Davis (August 24): Commercial damage has occurred for the first time in the history of the corn borer in this State.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

North Carolina. W. A. Thomas (August 22): Late corn being attacked rather heavily in the vicinity of Whiteville, in the southern part of the State. Most of the premises where this insect is present indicate that a heavy growth of weeds or other crop refuse was on the land prior to planting.

South Carolina. W. C. Nettles (August 22): More numerous in the central part of the State than in any year since 1935.

Georgia. O. I. Snapp (August 16): Has injured young lima bean plants at Fort Valley, central Georgia.

Mississippi. C. Lyle (August 24): Severe injury to several fields of corn reported on August 22 from Lauderdale and Newton Counties, east-central Mississippi. Cowpea plants injured recently received from Columbus, Lowndes County, in the eastern part of the State.

Louisiana. C. O. Eddy (August): Reported to be doing a lot of damage on the later corn in a number of sections in southern Louisiana.

CHINCH BUG (Blissus leucopterus Say)

Iowa. C. J. Drake (August 22): Rapidly increasing in numbers in the three southern tiers of counties of the State, being particularly abundant in the western part of the area.

Missouri. L. Haseman (August 24): Infestations in numbers sufficient to alarm farmers continue to be spotted. The month of August decidedly favorable to the development of the insect.

Oklahoma. F. A. Fenton (August 20): Present in southeastern Oklahoma at Durant, Bryan County.

CORN LEAF APHID (Aphis maidis Fitch)

North Carolina. M. D. Leonard (July 30): Observed several badly infested fields and had reports that corn had recently been considerably infested in Martin County, in the northeastern part of the State. Continued rains slowed up the infestation recently.

Ohio. T. H. Parks (August 20): Outbreaks occurred in Union and Mercer Counties, western Ohio. Predators were abundant and effective.

Indiana. J. J. Davis (August 24): Between July 29 and August 14 numerous reports were received of severe infestations throughout the northern half of the State, with definite damage, especially to hybrid seed corn, in many cases.

E. V. Walter (August 23): More common than usual throughout the State until about August 10. Observations made at La Fayette at that time indicated that most of the bugs died within a few days.

Minnesota. A. G. Ruggles and assistants (August): Corn leaf aphid abundant in the following counties in central and southern Minnesota: Blue Earth, Chippewa, Faribault, Martin, Stearn, and Wright.

Iowa. C. J. Drake (August 22): Apparently unusually abundant. Infestations seem to be general and widespread. Complaints received from localities scattered throughout the State.

Nebraska. M. H. Swenk (August 23): Reported as attacking corn in Platte, Polk, and Washington Counties, eastern Nebraska, late in July and early in August.

Utah. G. F. Knowlton (August 3): Aphids are abundant on corn leaves at Spanish Fork.

CORN LANTERN FLY (Peregrinus maidis Ashm.)

North Carolina. W. A. Thomas (August 22): Observed to be unusually abundant on a small field of corn at Whiteville. The buds of the plants were completely covered with adults in many instances and egg laying was in full progress. The small corn is badly wilted as a result of the attack.

Texas. R. K. Fletcher (August 22): A very heavy infestation found on late field corn in Burleson County. Corn showed severe injury.

CORN ROOTWORM (Diabrotica longicornis Say)

Nebraska. M. H. Swenk (August 23): Beetles in abundance attacking corn plants in a Dodge County, east-central Nebraska, field on August 13.

CORN FLEA BEETLE (Chaetocnema pulicaria Melsh.)

Ohio. G. A. Runner (August 23): Extremely abundant in cornfields in several localities.

BILLBUGS (Calendra spp.)

South Carolina. W. C. Nettles (August 22): Damage by corn billbugs above normal in the east-central part of the State.

ALFALFA

PEA APHID (Illinoia pisi Kltb.)

Maine. J. H. Hawkins (August 16): More abundant in old clover fields than on clover which was seeded in canning peas this year at Unity, south-central Maine. A fungus disease completely controlled the aphids on late peas at Monmouth, south-central Maine, and at other places this summer.

Utah. G. F. Knowlton (August 22): Pea aphids not abundant on alfalfa in fields examined throughout the State during the latter part of July and in August.

PLANT BUGS (Lygus spp.)

Utah. C. J. Sorenson (August 22): Lygus hesperus Knight and L. elisus Van D. moderately abundant in alfalfa-seed fields of Millard County, west-central Utah, and very abundant in similar fields in the north-western part of Cache County, north-central Utah.

THREE-CORNERED ALFALFA HOPPER (Stictoccephala festina Say)

Texas. R. K. Fletcher (August 22): Very abundant on field peas in Brazos and Burleson Counties.

COWPEAS

COWPEA CURCULIO (Chalcodermes aeneus Boh.)

Georgia. T. L. Bissell (August 22): Early peas well infested at Experiment, central Georgia. (August 23): At a cowpea cannery at Mitchell, east-central Georgia, about 10 percent of the peas are reported to be stung by this insect. Last year the stings ran up to 30 percent and higher.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

North Carolina. W. A. Thomas (August 15): Doing considerable damage to field cowpeas over most of the territory surrounding Chadbourn. The foliage of the plants in many instances is completely riddled.

CLOVER HAY WORM (Hypsopygia costalis F.)

Mississippi. C. Lyle (August 24): Specimens received on July 3 from Gulfport, Harrison County, southern Mississippi, with a report that they were abundant in pea hay.

SORGHUM

SORGHUM WEBWORM (Celama sorghiella Riley)

Texas. R. K. Fletcher (August 22): Present on sorghum in Bell County, northern Texas. Also increasing on late-planted grain sorghum in Brazos and Burleson Counties.

SUGARCANE

BORERS (Diatraea spp.)

Florida. A. N. Tissot (August 23): Larger cornstalk borer (D. crambidoides Grote) sent in from Quincy, northwestern Florida, where it was injuring late corn.

Louisiana. B. A. Osterberger and E. R. Lett (August 8): Cane borers (D. saccharalis F.) very numerous in the De Ridder section, Beauregard Parish, southwestern Louisiana, on corn and sugarcane. Many eggs collected, 80 percent of which were parasitized by Trichogramma spp.

Texas. R. K. Fletcher (August 22): Sugarcane borer on rice in Matagorda County and on corn and sorghum in Galveston County, both counties located on the coast.

AN EARWIG (Doru aculeatum Scudd.)

Florida. A. N. Tissot (August 23): Several specimens sent in from Ocala, central Florida, where they were reported to be causing some damage to corn and sugarcane.

F R U I T I N S E C T S

YELLOW-NECKED CATERPILLAR (Datana ministra Drury)

Connecticut. G. H. Plumb (August): Larvae very abundant in the following localities: New Haven and Seymour, in New Haven County; Canton and Windsor, in Hartford County; and Greenwich, in Fairfield County. Stripping quite heavy on smaller oak trees at Windsor.

Pennsylvania. H. E. Hodgkiss (August 25): Yellow-necked caterpillar generally abundant in apple orchards.

Illinois. W. P. Flint (August 24): Abundant throughout the State.

Minnesota. A. G. Ruggles and assistants (August): Abundant near Hibbing and Virginia, in St. Louis County, and on apple, ornamental walnut, and black walnut trees in Dakota County, both counties in eastern Minnesota.

Missouri. L. Haseman (August 24): Second-generation larvae beginning to appear at Columbia.

RED-HUMPED CATERPILLAR (Schizura concinna S. & A.)

Maine. F. H. Lathrop (August 22): Increase in infestation in central and southern Maine this summer.

Pennsylvania. H. E. Hodgkiss (August 25): Reported from various localities throughout the State.

Montana. H. B. Mills (August 20): Observed at Dixon, northwestern Montana.

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

Indiana. L. F. Steiner (August 25): Adults found boring into the fruit on a weak apple tree at Vincennes, southwestern Indiana. Tree showed no evidence of prior attack. Feeding apparently incidental to oviposition. As many as eight feeding cavities on individual apples.

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Texas. R. K. Fletcher (August 22): San Jose scale recorded from Bexar County, south-central Texas, on plum and pecan.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (August 26): First-brood adults began appearing in bait traps at Poughkeepsie on July 24; peak captures from August 2 to 5; daily bait-trap captures tapering off from August 5 to the present, when few moths being captured. Second-brood entrances

present by August 1 and gradually increasing in numbers through August 13. Injury in most orchards lighter than during the previous two seasons.

N. Y. State Coll. Agr. News Letter (August 15): Control measures still necessary in western New York against second brood.

New Jersey. E. Kostal (August 15): Following a light first brood, moderate infestation of second brood on apple at Morganville, in Monmouth County.

Pennsylvania. H. E. Hodgkiss (August 25): Second-brood entrances observed in the south-central counties during mid-August.

Virginia. W. J. Schoene (August 23): Infestation in central Virginia apparently influenced by heavy and continued precipitation during June and July, as fewer worms have been reported than for many years.

W. S. Hough (August 19): Peak of first-brood attack about June 22-26, 3 weeks later than normal. Second-brood injury occurring in August, whereas it is usually expected during the last week of July in Frederick, Clarke, and Shenandoah Counties, northern Virginia.

A. M. Woodside (August 20): Infestation increasing fairly rapidly during the last 3 weeks in Augusta County, northwestern Virginia. Flight and egg laying by first-brood moths over in the insectary and declining sharply in the orchards. Very few second-brood larvae have pupated.

South Carolina. W. C. Nettles (August 22): Infestation apparently high, perhaps because of light crop.

Ohio. T. H. Parks (August 20): Bait-pan catch of second-brood moths continuing at Columbus, but showing only a light population. Infestation over the State probably less than normal, with prospects of heaviest damage in old orchards located near Toledo.

Kentucky. W. A. Price (August 24): Extremely abundant at Henderson, western Kentucky, in orchards with small crops of fruit, where later control measures were omitted. On August 13 as high as 27 stings and entries were found on a single fruit.

Indiana. L. F. Steiner (August 25): Hatching of third-brood larvae at Vincennes now apparently at its peak. Infestation about normal in well-sprayed orchards. Most larvae now leaving apples and appearing to enter hibernation. Adults of the first brood at their maximum abundance about mid-July; in most orchards no well-defined peaks; and attack throughout July and August continuous and heavy.

Michigan. R. Hutson (August 22): Peak of flight of moth apparently at South Haven on August 15. Moths appeared in cages throughout the State as follows: Monroe, Eau Claire, and Allegan on July 18; Vandalia on July 19; Saint Joseph, Monroe, and Lapeer on July 20; Buchanan, Ann Arbor, Albion, South Haven, and Birmingham on July 21; Grand Rapids on July 25; Fennville on July 26; Grand Rapids, South Haven, and Lawton on July 28; Shelby on July 30; Rockford on August 1; Old Mission on August 2; Rapid City on August 4; Beulah on August 5; Traverse City on August 6; and Cheboygan on August 8.

Missouri and Kansas. H. Baker (August 23): Peak bait-trap catches of first-brood moths taken in northeastern Kansas and northwestern Missouri on August 13. Other peak catches on July 14, July 24, and August 3. Second-brood damage about normal.

Missouri. L. Haseman (August 24): Codling moth very irregular in its development, and appearance of third-generation moths about 2 weeks later than normal. Usually reaches height of emergence around Columbia on August 15 but apparently coming around September 1 this year, causing probably only a partial third generation.

Utah. C. J. Sorenson (August 22): Moderately abundant in Utah County, north-central Utah.

Washington. E. J. Newcomer (August 16): First-brood moths appearing in baits in numbers from June 23-28 in the Yakima Valley, south-central Washington. Maximum reached during the 10 days from July 13 to 22, although large numbers are still being caught. Second brood about a month earlier than in 1937 and a larger third brood than usual is expected.

LEAF MINERS (Gracilariidae)

New York. N. Y. State Coll. Agr. News Letter (August 8): Considerable tentiform leaf miner injury showing in several orchards in Columbia County, eastern New York. (August 15): Leaf miners, the spotted tentiform (Lithocolletes blancardella F.) and the unspotted tentiform (Ornix gminatella Pack.), causing considerable injury to apple and quince foliage in one orchard in Orleans County, western New York.

Delaware. L. A. Stearns (August 19): The unspotted tentiform leaf miner is causing considerable damage to foliage of apple at Cheswold, Kent County, frequently making from 3 to 5 mines per leaf.

Virginia. W. S. Hough (August 19): Two species of leaf miner (L. blancardella and O. gminatella) more abundant than usual in Frederick and Clarke Counties. Adults very numerous late in July and early in August. Apple foliage in restricted areas showed considerable damage.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

Maine. F. H. Lathrop (August 22): An increased infestation in apples in

the central and southern parts of the State. A distinct increase in infestation of blueberries in Washington County, eastern Maine.

Vermont. H. L. Bailey (August 27): Reported as more than usually abundant in southern Vermont.

New York. N. Y. State Coll. Agr. News Letter (August 8): Present on Long Island, concentrated on transparent crab. Egg stings very numerous on this variety.

New Jersey. E. Kostal (August 15): Infestation in apples heavy in early and midseason varieties at Morganville, Monmouth County. Damage moderate to severe.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Connecticut. P. Garman (August 22): Infestation most severe in mid-July. Worse on varieties heavily treated for disease control.

New York. N. Y. State Coll. Agr. News Letter (August 15): In western New York red mites on prunes still serious in orchards where proper control measures were omitted.

Pennsylvania. H. E. Hodgkiss (August 25): European red spider continuing to cause heavy foliage damage in apple orchards throughout the State.

Virginia. W. S. Hough (August 19): More abundant than ever observed in 17 years' residence in the orchard region of Frederick County. Foliage in some orchards shows the characteristic pale coloration caused by mites.

British Columbia. E. J. Newcomer (July 21): European red mite very numerous, and spraying for it general in the Okanogan Valley, southern British Columbia, bordering on Washington.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Maine. F. H. Lathrop (August 22): New adults emerging during August, resulting in a slight increase in the number of curculios near Monmouth, Kennebec County, south-central Maine. No evidence of oviposition by the new adults.

Vermont. H. L. Bailey (August 27): Causing a large amount of damage to apples throughout the State.

Virginia. A. M. Woodside (August 20): Only a small percentage of the first-brood adults deposited eggs. No eggs deposited in the insectary after July 19. Fruit infestation at harvest light in Albemarle County, north-central Virginia.

West Virginia. H. W. Allen (August 22): Infestation rather severe in peaches being harvested in the vicinity of Martinsburg, northeastern West Virginia, on August 15.

Georgia. O. I. Snapp (August 19): Second-generation adults emerging in large numbers at Fort Valley, central Georgia, from August 10 to 15. Of 210 adults taken from 30 trees on August 10 and 218 taken from 30 trees on August 15, practically all were second-generation beetles. Population in central-Georgia peach orchards increased materially during August and is now heavier than that of the average year. Seventy-one percent of first-generation females deposited eggs this year.

Kentucky. W. A. Price (August 24): Second-generation larvae infesting ripe peaches at Shakertown and Jonesville, north-central Kentucky, and at Paducah, western Kentucky, late in July and early in August. Second-generation adults emerging during the third week of August.

CITRUS ROOT WEEVIL (Pachnaeus opalus Oliv.)

Georgia. O. I. Snapp (August 15): Taken on August 15 from a peach tree at Fort Valley while jarring for plum curculio. Previously taken from a peach tree here on July 8, 1924. Rare in Georgia.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (August 22): More abundant than usual. Early peaches heavily infested.

New York. N. Y. State Coll. Agr. News Letter (August 1): Not the usual amount of damage to terminals of peaches in Monroe County, western New York.

Maryland, Virginia, and West Virginia. H. W. Allen (August 22): Infestation counts of peaches recently completed in a number of localities in Maryland, Virginia, and West Virginia. Heavy infestation in the vicinities of Harrisonburg and Timberville, Va. Moderately heavy infestation in the vicinities of Staunton and Winchester, Va. Despite a very favorable season for development, infestation at Crozet, Va., and in Washington County, Md., very light. Parasitization normally heavier in Washington County, Md., and in Crozet, Va., than in any of the other districts mentioned in this survey.

Virginia. W. S. Hough (August 17): Larvae caused cullage of 20 percent of peaches harvested in Frederick and Shenandoah Counties. Damage in the Timberville district apparently greater than observed in that area for a number of years.

Georgia. O. I. Snapp (August 19): Flowering peach trees, planted on the streets of Fort Valley, attacked, many terminals of trees being damaged. Also the case in some nonbearing peach orchards.

Mississippi. C. Lyle (August 24): Apple fruit containing a larva received from Oktibbeha County, east-central Mississippi, on August 23. Several complaints of injury, evidently caused by this species, received from various sections of the State. Injury in the north-eastern part of the State reported as quite conspicuous, many young trees having been attacked.

Ohio. G. A. Runner (August 23): Twig injury abundant and general owing to good growth caused by wet season. Varieties of peaches now ripening not seriously damaged, the early ripening of the fruit apparently helping to reduce fruit injury.

PEACH BORER (Conopia exitiosa Say)

Georgia. O. I. Snapp (August 19): Cocooning increased rapidly from August 11 to 13 at Fort Valley, but peak expected a little later than usual. Thirty-six cocoons collected on August 11, and 52 on August 13, during the same length of time. Infestation moderate.

Mississippi. C. Lyle (August 24): Adults now emerging in the vicinity of State College, northeastern Mississippi. Moderate damage to peach trees reported from Hinds and Madison Counties, central Mississippi.

Oklahoma. F. A. Fenton (August 20): Peach tree borer reported at Vian, Sequoyah County, eastern Oklahoma.

PEACH TWIG BORER (Anarsia lineatella Zell.)

Utah. G. F. Knowlton (August 1): Injury severe in peaches examined at Castleton, southeastern Utah.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

New York. N. Y. State Coll. Agr. News Letter (August 15): Control measures being applied in some orchards in western New York. Large percentage of late brood washed off by recent heavy rains.

PEAR LEAF-ROLLING MIDGE (Dasyneura pyri Kieff.)

New York. E. P. Felt (August 23): Pear leaf midge found in small numbers at Cold Spring Harbor, Long Island.

CHERRY

PEAR SLUG (Eriocampoides limacina Retz.)

Pennsylvania. H. E. Hodgkiss (August 25): Pear slug somewhat abundant on cherry in the northeastern counties of the State.

Indiana. J. J. Davis (August 24): Cherry and pear slug defoliated cherries during the first half of August in southern and central Indiana.

GRAPE

GRAPE LEAF FOLDER (Desmia funeralis Hbn.)

Mississippi. C. Lyle (August 24): Injured grape leaves received from Long Beach, Harrison County, southeastern Mississippi, on August 22. Also abundant on grapes at State College.

California. G. H. Kaloostian (August 6): First adults of second generation observed at Fowler, in Fresno County, central California, on August 5 and 6. A third-brood larva, about 4 days old, also observed on August 6. The insect is a new pest in this district, and has spread during the last two years more than 10 miles westward from the Sanger-Parlier districts.

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

Ohio. G. A. Runner (August 23): Damage from the late brood threatening to be serious, owing to concentration on an extremely light crop of grapes in some localities. In vineyards bearing a full crop, percentage of damaged grape berries apparently not greater than in 1937.

SIX-SPOTTED GRAPE BEETLE (Pelidnota punctata L.)

Pennsylvania. H. E. Hodgkiss (August 25): Spotted vine chafer plentiful but not so abundant as in some years.

Nebraska. M. H. Swenk (August 23): Specimens sent from Clay County, southern Nebraska, on July 25, where they were attacking grapevines.

APPLE TWIG BORER (Schistoceros hamatus F.)

Mississippi. C. Lyle (August 24): Adults received on August 22 from Long Beach, Harrison County, with the statement that the beetles had practically destroyed the top growth of a grape planting.

GRAPE SAWFLY (Erythraspides pygmaea Say)

Massachusetts. A. I. Bourne (August 24): Larvae found very numerous in a planting near the college in Amherst, ~~west~~-central Massachusetts.

Pennsylvania. H. E. Hodgkiss (August 25): Grapevine sawfly causing some damage in the northeastern counties.

GRAPE LEAFHOPPERS (Erythroneura spp.)

New York. N. Y. State Coll. Agr. News Letter (August 8): Grape leafhopper (E. comes Say) doing considerable damage in some vineyards in Columbia County.

Ohio. G. A. Runner (August 23): Various species of Erythroneura in general not so abundant and injurious as in former years. In some instances, where control measures were omitted, the late summer brood is heavy. Of the forms present in the Sandusky area, north-central Ohio, the three-banded grape leafhopper (E. tricineta var. cymbium McAtee) is the most abundant.

Nebraska. M. H. Swenk (August 23): Reported as attacking grapes in Lancaster County, eastern Nebraska, on August 5, and woodbine vines in Garden County, western Nebraska, on August 18.

Utah. G. F. Knowlton (August 22): Grape leafhoppers seriously damaging foliage of grape and Virginia creeper in many parts of Utah.

GRAPEVINE APHID (Aphis illinoisensis Shim.)

Ohio. G. A. Runner (August 23): Brown grape aphid prevalent in the Sandusky area, but not abundant enough to cause important injury.

GRAPE MEALYBUG (Pseudococcus maritimus Ehrh.)

Ohio. G. A. Runner (August 23): Grape mealybug common in many vineyards but not abundant in the Sandusky area.

PECAN

APHIDS (Aphididae)

Georgia. T. L. Bissell (August 24): Trees noticeably spotted by the feeding of the black pecan aphid (Melanocallis caryaefoliae Davis) at Milner and Griffin, central Georgia, but as yet no defoliation observed.

Mississippi. C. Lyle (August 24): General discoloration on leaves of most pecan plantings in the vicinity of Meridian, eastern Mississippi, caused by black pecan aphids. Light infestation in Jackson, Hinds County. Specimens of Longistigma caryae Harr. sent in on August 23 from Canton, Madison County, central Mississippi, with report that they were very abundant on pecan trees.

Texas. C. B. Nickels and W. C. Pierce (August 7): Black-margined aphid (Monellia costalis Fitch) more abundant than usual on pecan at Crystal City, Gustine, Branbury, and Stephenville, central and southern Texas. Leaves from 50-to 100-percent infested.

HICKORY-NUT CURCULIO (Conotrachelus affinis Boh.)

Mississippi. C. Lyle (August 24): Small percentage of pecan drops received from Shaw, Bolivar County, Meridian, Lauderdale County, and Tchula, Holmes County, found to be infested.

PECAN WEEVIL (Curculio caryae Horn)

Georgia. T. L. Bissell (August 24): No weevils or damage to pecan trees observed on August 23 at Sparta, central Georgia, although known to be present in this locality. On August 24 weevils at Milner about one-third as abundant as a week ago, probably owing to dry weather which is hindering emergence from soil.

WALNUT

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Connecticut. G. H. Plumb (August): Considerable defoliation noticed at New Haven and Windsor, particularly on smaller trees at Windsor.

E. P. Felt (August 23): Walnut caterpillar somewhat abundant and injurious in southwestern Connecticut.

New Jersey. H. W. Allen (August 22): Extensive defoliation of black walnut noted in several counties of southern New Jersey. Stripping was complete on many trees, but following abundant rainfall, many trees have put out new foliage and partly recovered from the defoliation.

T. H. Jones (August 20): Black walnuts growing in northern New Jersey commonly defoliated, presumably by this species.

Pennsylvania. H. E. Hodgkiss (August 25): Reported as very abundant.

Delaware. L. A. Stearns (August 12): General on walnut throughout the State.

Ohio. E. W. Mendenhall (August 15): Walnut trees throughout central and southern Ohio nearly all defoliated.

Indiana. J. J. Davis (August 24): Walnut trees defoliated throughout central Indiana, and reported from other parts of the State also.

Illinois. W. P. Flint (August 24): Defoliation of walnuts and hickories quite general over the State.

Michigan. R. Hutson (August 22): Numerous around Detroit, South Haven, Benton Harbor, and Monroe. Apparently full-grown specimens collected at Kalamazoo on August 9.

Missouri. L. Haseman (August 24): At Columbia laboratory-reared first-generation walnut caterpillars are emerging as adults, but no evidence of emergence out of doors. A partial second generation is expected.

CITRUS

WHITEFLIES (Dialeurodes spp.)

Florida. J. K. Holloway (August 18): In the vicinity of Orlando, central Florida, whiteflies (D. citri Ashm. and D. citrifolii Morg.) are completing the summer generation. Peak emergence has not been reached. Some eggs, and a few first-stage nymphs of the autumn brood observed.

Mississippi. C. Lyle (August 24): Reports from various parts of the State indicate that whiteflies (D. citri) are abundant on various ornamental plants.

PURPLE SCALE (Lepidosaphes beckii Newm.)

Florida. H. Spencer (August 20): Purple scale spreading rapidly from twigs and older leaves to the new growth and fruits.

California. Exch. Pest Control Circ. (August): A noticeable build-up throughout the Whittier-Rivera area, in Orange County during the last year.

FLORIDA RED SCALE (Chrysomphalus aonidum L.)

Florida. H. Spencer (August 20): Much in evidence on the eastern coast. Second reproductive peak of the year, starting about the middle of May, is still in progress with a few females still producing eggs. Infestations not so severe in the central-Ridge section.

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

California. Exch. Pest Control Circ. (August): Rapid increase in red scale in the interior areas during July. Beginning now to show a build-up toward the coast. Heavily infested orchards in the interior show green oranges deeply pitted by the young scale.

BLACK SCALE (Saissetia oleae Bern.)

California. Exch. Pest Control Circ. (August): Completion of hatch hastened by recent hot spell. Mortality of young to date of no consequence. A tendency toward build-up noted this year in such areas as Rivera and Anaheim, southern Orange County. Control measures necessary in double-brooded areas of Orange, Los Angeles, and Ventura Counties, as well as in the resistant black scale area of eastern Los Angeles County and western San Bernardino County (Pasadena to Cucamonga).

A LEAF-CUTTING ANT (Atta sp.)

Florida. H. Spencer (August 20): Have had called to our attention a third case of injury to newly planted citrus from leaf-cutting ants, probably Atta septentrionalis subsp. obscurior var. seminole Wheeler. In each case the trees had been planted on land recently cleared of underbrush. Some of young trees had all leaves stripped off by these ants. Damage in one instance was increased by work of grasshoppers and larvae of the orange dog (Papilio thoas L.).

A BUD MITE (Eriophyes sheldoni Twing)

California. A. M. Boyce (August 19): Bud mite infestation serious, causing extensive injury on thousands of acres of lemons at Santa Paula, southern California, and some injury on oranges.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. H. Spencer (August 20): More russetting this season than usual but infestations are subsiding naturally.

Louisiana. C. O. Eddy (August): Extremely abundant and doing a lot of damage where control measures were not applied consistently.

FIG

THREE-LINED FIG BORER (Ptychodes trilineatus L.)

Mississippi. C. Lyle (August 24): Specimens on fig received from Laurel, Jones County, southeastern Mississippi, on July 25.

PERSIMMON

PERSIMMON PSYLLA (Trioza diospyri Ashm.)

Louisiana. C. O. Eddy (August): Common on wild persimmons throughout the season. Especially abundant on the older trees early in the season and has continued on the smaller shrubs.

SEAGRAPE

WOOLLY WHITEFLY (Aleurothrixus howardi Quaint.)

Florida. E. A. Back (June 19): Woolly whitefly colonies found on seagrape foliage at Key West.

TRUCK - CROP INSECTS

BLISTER BEETLES (Meloidae)

Ohio. E. W. Mendenhall (August 22): Black blister beetles (Epicauta pennsylvanica Deg.) are injurious on gladiolus flowers in Franklin County, central Ohio.

Arkansas. D. Isely (August 22): Blister beetle injury reported from practically all counties in the northern half of the State. Most of the specimens submitted are striped blister beetle (E. vittata F.).

Mississippi. C. Lyle (August 24): Considerable damage to late tomatoes by E. lemniscata F. reported from various sections of the State. Specimens of E. marginata F. were sent in on August 19 from Paulding, Jasper County, southeastern Mississippi, with the report that they were found on practically all garden plants.

Nebraska. M. H. Swenk (August 23): Blister beetles reported damaging potato and tomato in Dawson County, central Nebraska, on August 1, and tomatoes and other garden crops in Pawnee County, southeastern part of the State, on August 2. Gray blister beetle (E. cinerea Forst.) reported attacking tomato, principally, and potato plants in Richardson, Douglas, and Jefferson Counties during late July and early August. Complaints of damage to tomato, and in one instance, pigweed, by striped blister beetle (E. lemniscata F.) were received from Richardson, Douglas, Pawnee, Lancaster, and Kearney Counties during the latter part of July. The immaculate blister beetle (Macrobasis immaculata Say) was reported late in July from Adams and Kearney Counties in the south-central part of the State, where it was damaging potatoes and Chinese elm trees. Tomatoes, potatoes, and other garden crops in Richardson, Seward, and Jefferson Counties reported damaged by the segmented blister beetle (M. segmentata Say).

Kansas. H. R. Bryson (August 24): Blister beetles abundant but for the most part not doing much damage. Pigweed and other weeds apparently heavily infested. Injury to crops largely confined to tomato patches.

CUCUMBER BEETLES (Diabrotica spp.)

Massachusetts. A. I. Bourne (August 24): Summer brood of striped cucumber beetles present during the early part of the month and much more abundant than usual for this brood.

South Carolina. J. G. Watts (August 10-25): Spotted cucumber beetle, banded cucumber beetle, and striped cucumber beetle abundant on fall cucumbers and coming to trap light in larger numbers than at any time during this season. Field estimates on D. vittata show that they are no more abundant now than they were on early summer cucumbers. Observations made at Blackville, Barnwell County, in the southwestern part of the State.

- Mississippi. C. Lyle (August 24): Injury to late watermelons by D. vittata reported recently from Rankin and Hinds Counties, western Mississippi, and from Tate County, northwestern Mississippi. On July 28 specimens were received from Itawamba County, northeastern Mississippi, with the report that they were very abundant and causing much damage to watermelons.
- Iowa. C. J. Drake (August 22): Southern corn rootworm (D. duodecimpunctata F.) reported as damaging corn at Harlan, Council Bluffs, and in other parts of Pottawattamie and Shelby Counties, western Iowa.
- Missouri. L. Haseman (August 24): Late cucumbers and squash at Columbia were recently very severely attacked by swarms of striped cucumber beetles. The 12-spotted beetle is equally abundant and even more destructive than the former at Columbia.
- Minnesota. A. G. Ruggles and assistants (August): In Hennepin County, southeastern Minnesota, and Pipestone County, southwestern Minnesota, striped cucumber beetles are very abundant.
- Texas. J. N. Roney (August 22): Cucumber beetles (D. duodecimpunctata and D. balteata) reported on tomato, collards, eggplant, pepper, and mustard in Galveston County, southeastern Texas.
- Montana. H. B. Mills (August 20): Striped cucumber beetle appeared for the first time in Montana this year, according to our records. Specimens identified from Culbertson, Roosevelt County, northeastern Montana, and from Billings, Yellowstone County, in the south-central part of the State.
- Utah. G. F. Knowlton (August 1): D. duodecimpunctata damaging cucumbers at Moab.

TARNISHED PLANT BUG (Lygus pratensis L.)

- Vermont. H. L. Bailey (August 27): Very abundant in potato fields in Orleans and Caledonia Counties, northeastern Vermont.
- New York. N. Y. State Coll. Agr. News Letter (August 8): Causing noticeable injury to cauliflower heads in Delaware County, eastern New York. In western New York in upland fields they are numerous. They are more abundant than usual in up-State New York and in some places doing considerable damage. (August 22): In Wayne County, western New York, the bugs are still fairly numerous in celery fields and considerable fresh damage was found this week.

SALT-MARSH CATERPILLAR (Estigmene acraea Drury)

- Maine. J. H. Hawkins (August): In central Maine a serious outbreak on corn, beans, lettuce, and other vegetables was checked by an unidentified fungus disease, which killed most of the caterpillars before they were fully grown but not until serious injury was inflicted.

especially to vegetable gardens.

CRICKETS (Gryllidae)

Indiana. G. E. Gould (August 25): Crickets abundant in many fields in the northern part of the State; damage to carrots noted adjoining an uncultivated area.

O. J. Horvath (August 23): Mole cricket (Gryllotalpa hexadactyla Perty) sent in from South Bend. (Det. by A. B. Gurney.)

Missouri. L. Haseman (August 24): Unusually large number of mole crickets received during the month from northern, central, and southern Missouri.

Texas. J. N. Roney (August 22): Mole crickets (G. hexadactyla and Scapteriscus acletus R. & H.) reported on pepper, eggplant, black-eyed peas, cabbage, mustard, tomato, and collards in Galveston County.

POTATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Maine. J. H. Hawkins (August 16): Persisting in central and southern Maine, where control measures have not been followed throughout the season.

New York. N. Y. State Coll. Agr. News Letter (August 8): Second-generation beetles began laying eggs last week in western New York.

South Carolina. J. G. Watts (August 26): At Blackville a few adults have been found on tomato plants throughout the month of August.

Minnesota. A. G. Ruggles and assistants (August): Very abundant in the following counties scattered throughout the State: Aitkin, Carlton, Pipestone, Pope, Saint Louis, and Sherburne.

Nebraska. M. H. Swenk (August 23): Reported as attacking eggplant and tomato to a serious degree in Wayne County, northeastern Nebraska, on August 9.

POTATO FLEA BEETLES (Epitrix spp.)

Maine. J. H. Hawkins (August 16): Early infestation of E. cucumeris Harr. on potatoes in central Maine not followed by severe injury by the second brood, such as normally occurs.

Connecticut. N. Turner (August 22): Locally abundant in the entire central part of the State. Serious damage caused to potatoes and tomatoes late in July.

New York. N. Y. State Coll. Agr. News Letter (August 1): The beetle was reported to have been particularly noticeable on Long Island during the last week, emerging in large numbers from land planted to Cobblers,

the vines of which are dead. Border rows of Green Mountains and adjacent areas of lima beans received serious foliage injury by feeding adults.

Colorado. C. R. Jones (August 1): Prevalent on potatoes on the Western Slope.

Utah. G. F. Knowlton (August 1): Injury to potato foliage by the potato flea beetles (E. cucumeris and E. subcrinita Lec.) has been severe in several localities in Weber County, north-central Utah.

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Utah. H. E. Dorst (August 23): Damage to tomatoes in the form of western yellow blight is approximately 15 percent less than last year. At Hooper, in northern Utah, in 1937 the damage averaged 45 percent, as compared to 30 percent this year.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Connecticut. N. Turner (August 22): Apparently less abundant than usual in the entire potato-growing section.

New York. N. Y. State Coll. Agr. News Letter (August 15): In western New York, leafhoppers were present in large numbers on the remaining green foliage on muckland. On the upland leafhoppers began to show up in experimental plots in Genesee and Monroe Counties. In Wyoming County, injury was on the increase, although severe in only a few spots.

Virginia. H. G. Walker (August): Late potatoes near Norfolk are moderately infested. A field of young beans was also reported as being very heavily infested.

Minnesota. A. G. Ruggles and assistants (August): Very abundant in the following counties: Carlton, Crow Wing, Hennepin, Pope, Ramsey, and Saint Louis.

Utah. G. F. Knowlton (August 22): Moderate injury to potato foliage in northern Utah.

TOMATO PSYLLID (Paratrioza cockerelli Sulc.)

Colorado. C. R. Jones (August 1): Prevalent on potatoes and tomatoes where considerable damage is being done.

Montana. H. B. Mills (August 20): Has done considerable damage throughout the plains area of Montana. Reported from Great Falls, Bozeman, Stillwater County, Lavina, Bridger, Fromberg, Billings, Huntley, Miles City, and Sidney.

Utah. G. F. Knowlton (August 22): Injury to potatoes not reported very frequently.

GREEN PEACH APHID (Myzus persicae Sulz.)

Indiana. G. E. Gould (August 25): Aphids, probably this species, reported as a severe infestation on 100 acres of potatoes at North Judson, in northwestern Indiana, on August 2. Investigation a week later disclosed no lice. Coccinellid larvae were very abundant.

HORNWORMS (Protoparce spp.)

New Hampshire. J. G. Conklin (August 29): Tomato worm (P. quinquemaculata Haw.) unusually prevalent throughout the State.

Vermont. H. L. Bailey (August 27): Tomato hornworm (P. sexta Johan.) is unusually abundant throughout the State. Entire loss of several acres reported from Burlington, Chittenden County, in northwestern Vermont.

Missouri. L. Haseman (August 24): Tomato worm moths very abundant in flower gardens until about the middle of August, but practically disappeared in the last 10 days. Larvae now feeding on tobacco and tomatoes at Columbia.

Utah. H. E. Dorst (August 23): One field in northern Utah observed where 20 percent of the tomato plants were damaged by tomato hornworm. Most fields average from 2- to 5-percent infestation. Ordinarily little damage is observed in this area.

California. J. C. Elmore (August 17): The tomato hornworm is numerous on pepper plants; 180 worms per acre, or 2 per 100 plants, were counted in a pepper field near Long Beach, Los Angeles County.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Maine. J. H. Hawkins (August 16): Continuing to spread. In central Maine second-generation adults were found in many fields of beans grown for the dry-bean industry. Damage not extensive, except in the southwestern part of the State.

Connecticut. N. Turner (August 22): Second-generation larvae feeding on garden beans. Damage severe on untreated plantings.

New York. N. Y. State Coll. Agr. News Letter (August 1): For the first time in the history of the State, beans are threatened with serious injury, at least in the counties on the southern and western borders. First generation is now preponderantly in the pupal stage in most counties, but in Erie and other lake counties the insect is mostly in the first-generation adult stage. Serious injury is threatened in fields where a spotted or general infestation of first-brood larvae occurred and where no control measures were applied. (August 8): In the field-bean area (Steuben, Schuyler, Allegany, Livingston Counties)

the insect is largely in the adult stage, many eggs now being deposited. In Erie County the insect is about 5 days ahead of the "higher altitude" counties and larvae of the second brood are active.

New Jersey. H. W. Allen (August 22): Nearly complete defoliation of beans noted in a number of fields in the western part of Burlington County on August 21.

E. Kostal (August 15): Abundant and destructive on lima and string beans at Morganville, Monmouth County.

Virginia. H. G. Walker (August): Has been very abundant in many fields of beans and has seriously injured a great many plantings of beans in eastern Virginia, where not properly controlled.

North Carolina. W. A. Thomas (August 15): This insect has been unusually destructive to beans, cowpeas, and soybeans in the vicinity of Chadbourne, Columbus County, in the southern part of the State. The attack has been more disastrous to beans, mostly limas, than to the other crops.

M. D. Leonard (August 1): A patch of several acres of large plants with considerable foliage injured at Enfield, Halifax County, in the northeastern part of the State.

South Carolina. F. Sherman (August 22): Now more destructive at Clemson than is usual at this season.

J. G. Watts (August): Considerable damage is being done to beans in home gardens at Blackville.

Georgia. O. I. Snapp (August 14): Has utterly destroyed a crop of lima beans at Greenville, central Georgia.

T. L. Bissell (August 22): Adults and young are noticeable on soybeans and cowpeas. Also reported on a field of young lima beans.

Florida. A. N. Tissot (August 23): Infestation at Havana, Gadsden County, continuing to develop. Insects apparently becoming more numerous.

Tennessee. G. M. Bentley (August 23): Reports of damaging beans and peas in Davidson, DeKalb, Sumner, Warren, and Weakley Counties. Damage at this time heavier than earlier in the season. Approximately 100 percent of the leaves of lima beans punctured in Weakley County.

Ohio. N. F. Howard (August): Numerous and injurious in the Columbus area. In most gardens beans are defoliated unless control measures had been taken.

R. H. Nelson (August 15): First adult specimens of second-generation beetles noted near South Point, Lawrence County, in the southeastern part of the State, on August 15. Infestations general in the South Point area during August and untreated plantings severely injured.

G. A. Runner (August 23): Abundant on beans locally in the Sandusky area, northern Ohio.

Indiana. J. J. Davis (August 24): Continues to be very abundant throughout

the State.

Kentucky. W. A. Price (August 24): More active and numerous this season than usual.

Missouri. L. Haseman (August 24): In southeastern Missouri it has extended its western spread over the first two to four tiers of counties and has caused serious damage to garden plantings of beans as far west as Poplar Bluff.

Mississippi. C. Lyle (August 24): Infestations reported as follows: on August 21, stripping vegetable beans over Monroe County; on August 22, heavy infestation in Lauderdale, Jasper, and Newton Counties; on August 20, severe injury to beans at West Point, Clay County. Heavy damage in Chickasaw and Scott Counties. Reported on August 24 from Lafayette County for the first time.

Utah. G. F. Knowlton (August 1): Damaging beans at Castleton, Moab, Green River, and Huntington, all in eastern Utah.

A WEEVIL (Hypera meles F.)

New York. N. Y. State Coll. Agr. News Letter (August 1): In Livingston County, western New York, this weevil was observed destroying field beans growing adjacent to a barn in which clover hay had been placed recently. Injury was progressively less away from the barn and was absent 50 yards away. Plants near the barn contained from 10 to 50 weevils. During the last 3 weeks the clover-head weevil has been unusually abundant about barns in which hay has been stored.

COTTON-SQUARE BORER (Strymon melinus Hbn.)

Utah. G. F. Knowlton (August 6): Collected at Spanish Fork, north-central Utah. Reported as damaging pole beans in that vicinity. (Det. by C. Heinrich.)

BEAN APHID (Aphis rumicis L.)

New York. N. Y. State Coll. Agr. News Letter (August 1): Reported to be abundant in some fields of lima beans in Livingston County, western New York.

PEAS

PEA MOTH (Laspeyresia nigricana Steph.)

Maine. G. W. Simpson (August 1): About 30 percent of the pods of peas in a home garden at Presque Isle, northeastern Maine, were infested.

A MITE (Penthaleus major Duges)

California. E. O. Essig (August 11): This species was first taken by the writer on March 17, 1922, near San Jose, where it was attacking the springtail, Achorutes armatus Nicolet, swarming on the surface of fresh water in a drainage ditch. Specimens were sent to H. E. Ewing, who identified them as Penthaleus sp. Shortly afterwards in the same month, L. R. Cody called my attention to injuries to peas growing along the foothills near Warm Springs, Alameda County, by what appeared to be this species. The damage was considerable, but was restricted and for only a short time. A similar infestation recurred the following year, but has not been observed since. A few weeks ago, I received a small lot of the same species which had recently been collected by A. J. Nicholson at Riverside. A mounted slide of the mite was sent to H. Womersley, Adelaide, Australia. A letter from Mr. Womersley, dated July 13, 1938, says that the species is identical with the pea mite of that country, P. major.

CABBAGE

IMPORTED CABBAGE WORM (Pieris rapae L.)

New York. N. Y. State Coll. Agr. News Letter (August 15): Considerable damage to cabbage in eastern New York; heavy flights of moths present.

Indiana. G. E. Gould (August 25): Abundant in the northern part of the State, causing considerable damage to cabbage.

Missouri. L. Haseman (August 24): Butterflies very abundant in fields and gardens.

Utah. G. F. Knowlton (August 10): Butterflies are abundant at Brigham and Ogden, in northern Utah. Injury is common wherever control has not been effected.

CABBAGE LOOPER (Autographica brassicae Riley)

New York. N. Y. State Coll. Agr. News Letter (August 22): Larvae less numerous in western New York than early in August. A few looper eggs found in Wayne County.

Indiana. G. E. Gould (August 25): Abundant in the northern half of the State.

Utah. G. F. Knowlton (August 13): Nine moths taken in light trap at Logan, north-central Utah, on the night of August 12.

A WEEVIL (Ceutorhynchus assimilis Payk.)

Washington. M. J. Forsell (August 18): During 1938 these weevils have been scarce and have heard no complaints of damage in the fields.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. H. G. Walker (August): Rather abundant and seriously injuring cabbage at Drakes Branch, south-central Virginia. However, this insect is rather scarce and has caused practically no injury in the Norfolk area.

South Carolina. W. C. Nettles (August 22): Apparently above average at Clemson.

J. G. Watts (August 20): Collards in a number of home gardens at Williston, in the southwestern part of the State, are heavily infested.

Ohio. R. H. Nelson (August 15): Adults common and causing injury to late turnips. No nymphs found, but egg masses present.

Indiana. J. J. Davis (August 24): Reported on August 10 as very destructive to cabbage at Pekin, in the southern part of the State.

Kentucky. W. A. Price (August 24): Bugs did some damage to crops in the vicinity of Lawrenceburg, Anderson County.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Maine. J. H. Hawkins (August 16): Steadily increasing at Monmouth and moving northward and eastward from the southern part of the State.

Connecticut. N. Turner (August 22): Abundance much less, as compared with the average year.

New York. N. Y. State Coll. Agr. News Letter (August 22): In eastern New York squash bugs are reported damaging squash.

South Carolina. J. G. Watts (August 20): This insect is scarce on a planting of fall cucumbers at Blackville.

Florida. A. N. Tissot (August 23): Reported as being very abundant on summer squash at Hawthorne, eastern Alachua County.

Indiana. J. J. Davis (August 24): Abundant during August in central Indiana.

Iowa. C. J. Drake (August 22): Reported damaging squash at Corydon, Des Moines, and Ames, in central Iowa; What Cheer, in southeastern Iowa; and Palo, in east-central Iowa.

Missouri. L. Haseman (August 24): Adults and eggs less abundant during the latter half of the month but partly grown nymphs now very abundant on squash and related crops that have not been protected throughout central Missouri.

Nebraska. M. H. Swenk (August 23): Complaints of damage to squash, pumpkin and cucumber vines received from Richardson, Douglas, Saline, Custer, and Thomas Counties from July 21 to August 20.

Oklahoma. F. A. Fenton (August 20): Present at Perry, Noble County, in north-central Oklahoma.

Utah. G. F. Knowlton (August 17): Damage to cantaloups and squash reported from Farmington. (August 1): Reported as seriously damaging water-melons and cantaloups at Moab.

SQUASH BORER (Melittia satyriniformis Hbn.)

Connecticut. N. Turner (August 22): Early summer squash killed at Mt. Carmel farm. Abundant in other parts of the State.

New York. N. Y. State Coll. Agr. News Letter (August 8): Reported on squash on Long Island. (August 15): Injury continues to show in Wayne County western New York, and larvae appeared to be approaching maturity from August 2 to 8.

Pennsylvania. H. E. Hodgkiss (August 25): Borer very abundant throughout the State.

Ohio. G. A. Runner (August 23): Destructive in a number of localities.

Tennessee. G. M. Bentley (August 23): Reported on squash in Davidson County on August 3.

Nebraska. M. H. Swenk (August 23): Reported as injuring squash vines in Colfax County, east-central Nebraska, on August 10.

SQUASH BEETLE (Epilachna borealis F.)

Pennsylvania. H. E. Hodgkiss (August 25): Squash ladybird beetle moderately abundant in the northeastern counties.

CUCURBITS

PICKLE WORMS (Diaphania spp.)

South Carolina. J. G. Watts (August): A small planting of late summer cantaloups was completely destroyed by the melon worm (D. hyalinata L.). A few larvae are beginning to appear in the fall crop. One moth was taken at the light trap August 22. Reported from Blackville.

Indiana. J. J. Davis (August 24): Pickle worm (D. nitidalis Stoll) reported on August 15 and 17 as being destructive to pickles in east-central and northern Indiana.

G. E. Gould (August 25): For the second year, the pickle worm is infesting a serious number of the pickling cucumbers in northern Indiana. One large company forced to hire extra help to pick out wormy

cucumbers, and 600 wormy cucumbers detected in a week, over 100 of their 480 growers having brought in wormy cucumbers.

Mississippi. C. Lyle (August 24): Pickle worms reported on August 20 as being unusually bad in Grenada County, north-central Mississippi, destroying most of the late cantaloups.

MELON APHID (Aphis gossypii Glov.)

Indiana. J. J. Davis (August 24): Abundant and destructive generally throughout the State.

Minnesota. C. E. Mickel (August): Melon louse abundant in the vicinity of Saint Paul and Minneapolis.

Kansas. H. R. Bryson (August 25): Reported as destructive this year. Vines in some melon patches killed. Injury not confined to cucumbers and melons alone, but squash and pumpkins also damaged considerably.

Nebraska. M. H. Swenk (August 23): The melon aphid is damaging muskmelons, watermelons, and cucumbers in Douglas, Burt, Saline, Antelope, and Furness Counties.

Utah. G. F. Knowlton and F. C. Harmston (August 24): Cantaloup vines being destroyed at Green River, east-central Utah.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

North Carolina. C. S. Brimley (August 22): Infesting an asparagus bed at Thomasville. Damage severe.

South Carolina. J. G. Watts (August): During the first half of the month this insect continued to be very destructive, but since that time the population and injury has decreased considerably. Most fields in the asparagus-growing section of the State that have not been poisoned have been severely damaged. Crowns and young plants have been more seriously affected than older plants.

Utah. G. F. Knowlton (August 22): All stages found during the early part of August in several infested fields in Weber and Davis Counties.

Washington. E. J. Newcomer (August): Very common in the Yakima Valley.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Ohio. G. A. Runner (August 23): Abundance of turnip aphids making it difficult to obtain satisfactory stands of turnips in some localities.

EGGPLANT

EGGPLANT LACEBUG (Gargaphia solani Heid.)

North Carolina. W. A. Thomas (August 19): Attacking eggplant in the vicinity of Tabor City. The insects were extremely abundant, some affected leaves having more than 50 specimens grouped together on their under surfaces.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Colorado. C. R. Jones (August 1): More abundant on onions than for years and considerable damage being done.

PEANUTS

POTATO LEAFHOPPER (Emboasca fabae Harr.)

North Carolina. M. D. Leonard (August 1): Owing to continued rains, leafhopper damage on peanuts has been light, although many fields examined during the latter half of July in the six or seven heaviest peanut-growing counties in the northeastern part of the State showed a few leafhoppers present.

LETTUCE

A HORNWORM (Celerio gallii Rott.)

Maine. J. H. Hawkins (August 16): Taken in quantity as larvae from lettuce and other vegetables in Brewer, Penobscot County. Never before to my knowledge found in such large numbers in Maine.

STRAWBERRY

STRAWBERRY CROWN BORER (Tyloclerma fragariae Riley)

Indiana. J. J. Davis (August 24): Destructive in several localities in the southern third of the State and present in the southern two-thirds.

STRAWBERRY ROOT APHID (Aphis forbesi Weed)

Virginia. H. G. Walker (August): Abundant and has caused much damage in a number of strawberry fields near Norfolk.

Kentucky. W. A. Price (August 10): Attacking 13 percent of the strawberry plants examined in one patch at Princeton.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

California. J. C. Elmore (August 17): Causing serious damage to the chili peppers in some places in Orange and Los Angeles Counties. Infestations range from 2 to 50 percent in a single field. A field of bell peppers was 100 percent infested at Yorba Linda, on August 6.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

North Carolina. C. H. Brannon (August 20): Infestation in Edgecombe and adjacent counties reported as very severe on August 8.

South Carolina. F. Shorman and W. C. Nettles (August 22): There has been a marked increase of boll weevil over the whole State during August.

J. G. Watts (August): An unusually bad year for boll weevils at Blackville. Many fields not treated have only a fourth of a crop.

F. F. Bondy and C. F. Rainwater (August 27): By August 8 migrating weevils had almost covered cotton in Florence County, infestations being practically 100 percent, the worst since 1929 and 1930. Now very numerous and damaging late bolls.

Georgia. O. I. Snapp (August 19): Abundant in the vicinity of Fort Valley owing to favorable weather conditions. Considerable damage.

P. M. Gilmer and P. A. Glick (August 28): Migration was at its peak during the first week of August in Tift, Lowndes, Berrien, Cook, and Colquitt Counties, Upper Coastal Plain. Damage was serious and third-brood weevils fairly numerous.

Florida. L. C. Fife and C. S. Rude (August 27): Infestation very high the second week in August after migration had started in Alachua, Marion, and Gilchrist Counties. Infestation in Lake County was very light. At present all counties but Lake are highly infested, from 65 to 99 percent.

Mississippi. State Plant Board (August 15): Heaviest infestations in many years now present in most sections of Mississippi, especially the Delta. General migration of weevils in progress, and fields of late cotton reported to be full of weevils despite control measures.

C. Lyle (August 24): Infestation the heaviest in many years and late cotton being severely damaged in most cases. Delta counties, especially, very heavily infested and control measures rather general.

R. L. McGarr, et al. (August 27): By August 13 in Oktibbeha, Lowndes, and Noxubee Counties infestation had increased greatly. Average infestation was 52.8 percent as compared with 19.2 percent in 1937. Yield expected to be cut 50 percent or more.

E. W. Dunnam, et al. (August 27): Boll weevils at least 10 times as numerous as last season at this date in Washington County. Infestation practically 100 percent in all fields.

Louisiana. R. C. Gaines and assistants (August 20): Average of punctured squares in untreated check plots was 91.5 percent this week. Population heavy in all of the fields of Madison Parish, especially in young cotton.

Arkansas. D. Isely (August 23): Generally distributed over the State except in the northeastern part. While damage greater than in any year since 1932, extreme injury did not materialize owing to drought.

Oklahoma. C. F. Stiles (August 31): Infestation has increased very rapidly throughout the southeastern quarter of the State, and little top crop cotton expected to be produced this season throughout that area. Weevils more numerous this season in southeastern Oklahoma than since 1935, and perhaps worse than since 1933.

E. E. Ivy (August 21): Infestation has increased steadily in McCurtain County and is now at between 70 and 80 percent in all fields examined. Forty percent of the bolls have one or more eggs, larvae, or pupae in them, and between 10 and 15 percent of the locks have been destroyed.

Texas. F. L. Thomas (August 12): Weevils spotted but most abundant in the lowlands of central and northern Texas. Less damage now in Calhoun County, but more in the Lavaca River bottoms of Jackson County, (August 26): Abundant in most fields of young cotton and causing damage in the lowlands of Concho, Jones, McCulloch, and Taylor Counties, west-central Texas.

K. P. Ewing, et al. (August 6): Average of punctured squares observed to be 20.9 percent as compared to 12.2 percent last week in Calhoun and Jackson Counties. Severe damage in some fields, light to medium in all others inspected was observed in the vicinity of Waco and in the Brazos River bottom.

A. J. Chapman (August 20): Average infestation in 10 fields above the mouth of the Conchos and 8 below was found to be 59.66 percent. (August 27): Average infestation in 22 fields inspected was found to be 87.54 percent.

R. W. Moreland, et al. (August 6): In Brazos and Burleson Counties average infestation in check plots found to be 58.8 percent compared to 62.9 percent on August 8, 1936.

COTTON LEAF WORM (Alabama argillacea Hbn.)

South Carolina. F. F. Bondy and C. F. Rainwater (August 27): Adults but no larvae of cotton leaf worm found during the last 2 weeks in Florence County.

Tennessee. G. M. Bentley (August 23): Reported on August 19 and 20 as occurring in Madison, Fayette, Dyer, Gibson, Lauderdale, and Shelby Counties. Farmers using control measures. Approximately 10 percent of leaves destroyed at Trimble, Dyer County.

Mississippi. C. Lyle (August 24): Found generally over the 10 northwestern counties. Scattered throughout north-central Mississippi, but little damage noted. Causing considerable damage in several of the northeastern counties and in Itawamba County, fully 25 percent of the foliage being stripped in some fields. Spotted infestations in the vicinity of State College, with foliage ragged considerably in some fields.

R. L. McGarr, et al. (August 27): Observed in sufficient numbers to cause some ragging of cotton in Oktibbeha and Lowndes Counties.

E. W. Dunnam, et al. (August 6): Present in most fields in Washington County. First moth noted here was bred from larvae collected on July 25, which emerged on August 4. (August 20): Insect ragging cotton in some places but damage most serious in young cotton. (August 27): Stripping cotton in many fields, doing much more damage within the last few days.

Louisiana. B. A. Osterberger and E. R. Lett (August 8): Second generation just appearing at Merryville, Beauregard Parish. No serious damage from first generation in this section.

W. F. Turner (August 27): Infestations observed north of Bossier City, Bossier Parish. Spread increased, but not the severity, to the end of the bottom lands, just south of Benton. No fields completely stripped.

R. C. Gaines and assistants (August 13): Still present in fields in Madison Parish but not in sufficient numbers to cause ragging. (August 20): Leaf worms may be found in small numbers in most fields. Ragging may be noticed in some fields of young cotton.

M. T. Young and assistants (August 27): Found in practically all fields observed in Madison Parish but not in sufficient numbers to cause damage.

Arkansas. D. Isely (August 22): Generally distributed over Arkansas for the last month but no general injury occurring. Some local injury and local control measures.

Oklahoma. C. F. Stiles (August 31): Now present throughout practically all the cotton-producing areas of Oklahoma and numerous fields being defoliated.

E. E. Ivy (August 21): First found in the Red River bottom on July 24, and showed evidences of having been present for 2 or 3 weeks. Scattered, light infestations found all over this region in McCurtain County shortly after that, a few of the earlier infestations causing considerable injury, practically stripping the leaves in many of the fields. No further injury noted for a period of a week or 10 days, but now all infestations apparently spreading rapidly and many new ones observed.

Texas. F. L. Thomas (August 5): Fourth generation now active, causing damage as far north as central Texas. Scattered as yet in northern and northwestern Texas. (August 12): Control measures under way in southern Texas; extensive in the San Antonio area; general throughout central Texas; and just beginning in northern Texas. (August 26): Some injury observed on late-planted cotton in central Texas, but control measures being much less used.

H. S. Cavitt (July 30): Some poisoning being done in the vicinity of Candelaria. Causing some damage to young cotton at the lower end of the Presidio Valley around Redford.

K. P. Ewing, et al. (August 6): General throughout the Waco and Brazos River area of Calhoun and Jackson Counties, and more actual damage and stripping of plants observed around Waco than at any other point this year.

A. J. Chapman (August 27): Defoliation throughout August by leaf worms, as well as lack of water, has contributed to an earlier than usual maturity of the crop in the Presidio area.

R. W. Moreland, et al. (August 6): Considerable control work being done during the week in Brazos and Burleson Counties. (August 20): Some leaf worms still in the cotton.

Arizona. W. A. Stevenson (July 30): One small larva found at Sahuarita, Pima County, on July 28. (August 20): Further specimens found in the Sahuarita area but infestation still low.

BOLLWORM (Heliothis obsoleta F.)

South Carolina. F. F. Bondy and C. F. Rainwater (August 27): Bollworms observed on cotton in Florence County throughout August but no damage done.

Georgia. P. M. Gilmer and P. A. Glick (August 7): Considerable damage in fields near corn in Tift, Lowndes, Berrien, Cook, and Colquitt Counties. (August 28): Slight damage by large larvae in the Upper Coastal Plain. Little damage to dusted cotton.

Florida. A. N. Tissot (August 23): Doing some damage to cotton in Bonifay, Holmes County.

L. C. Fife and C. S. Rude (August 20): Doing a good deal of damage in some fields in Lake, Alachua, Marion, and Gilchrist Counties. (August 27): Present in all fields to some extent but not serious in most.

Mississippi. R. L. McGarr, et al. (August 6): No appreciable number of bollworms noted in Oktibbeha and Lowndes Counties.

E. W. Dunnam, et al. (August 27): A few bollworms found all month but no damage reported in Washington County.

Oklahoma. E. E. Ivy (August 21): Very numerous recently in McCurtain County, especially in younger cotton near corn, the infestation running to 20 or 30 percent in some fields, and averaging more than 5 percent.

Texas. F. L. Thomas (August 12): Second-generation bollworms threatening damage to young cotton in the Brazos Valley of central Texas. Severe damage caused by the first generation in some fields near Waco, with light to moderate damage found in all fields inspected. (August 26): Damage caused in the lowlands of Concho, Jones, McCulloch, and Taylor Counties. Severe damage reported from Kent County.

H. S. Cavitt (July 30): Considerable damage done in the lower end of the Presidio Valley, around Redford.

K. P. Ewing, et al. (August 6): Damage from bollworm apparently on the decline in Calhoun and Jackson Counties. Severe damage found in the vicinity of Waco, with light to medium damage in all other fields inspected. Damage reported also from the Brazos River bottom and the black land section. (August 20): Bollworms have practically ceased their activity except in a few fields of June-planted cotton.

A. J. Chapman (August 13): Reduction in bolls per plant due largely to the cotton bollworm. (August 20): Counts in fields above the Conchos indicate less damage than in the Presidio area. (August 27): Considerable damage done to the crop.

R. W. Moreland, et al. (August 13): Peak of oviposition for second brood occurred about the first of the week in check plots in Brazos and Burleson Counties. (August 20): Average of 7.7 eggs per 100 tops found as compared with 28.5 eggs per 100 tops 2 weeks ago.

Arizona. W. A. Stevenson (July 30): Very heavy outbreak observed in a field of late-planted Pima cotton in the Marana section, Pima County, the first part of the week. Feeding principally on the squares, with some bud feeding noted. Infestation general over the field and probably commercial damage will be caused. Infestation general in the Marana and Sahuarita sections but not so severe as in the first field mentioned. (August 6): Infestation in the Tucson district practically cleared up.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. R. E. McDonald (July and August): Toward the close of July pink bollworm was found in Kleberg County, this being the first specimen ever found in that section. Specimens have since been found in Brooks, Jim Wells, and Nueces Counties. Only a few worms found, indicating that the infestation is very light.

A. J. Chapman (August 13): Infestation counts made in 20 fields located in the Presidio and Redford area. Average infestation was 45.5 percent.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

South Carolina. F. F. Bondy and C. F. Rainwater (August 27): A few observed throughout the month but no damage found in Florence County.

Georgia. P. M. Gilmer and P. A. Glick (August 28): Present in some numbers from slightly south of Cordelo northward on the Upper Coastal Plain. No serious damage.

Mississippi. R. L. McGarr (July 30): Very few on cotton in Oktibbeha and Lowndes Counties.

Oklahoma. E. E. Ivy (August 21): Approximately the same degree of infestation maintained in McCurtain County, from 5 to 10 percent, all season, and blasted squares found in considerable numbers.

Texas. F. L. Thomas (August 5): Present in northwestern Texas, and increasing since the middle of July in Dickens and Wilbarger Counties.

R. W. Moreland, et al. (August 20): Few found in old cotton but population in young cotton fairly heavy since August 1. Population in late-planted cotton lighter than last week, but still causing some injury.

RAPID PLANT BUG (Adelphocoris rapidus Say)

South Carolina. F. F. Bondy and C. F. Rainwater (August 13): Nymphs numerous in several fields in Florence County.

Mississippi. R. L. McGarr (July 30): A few bugs noted in Oktibbeha and Lowndes Counties.

Texas. R. K. Fletcher (August 13): An average of 25 per 100 plants found on young cotton in Brazos and Burleson Counties. (August 20): One count in young cotton showed as many as 70 nymphs and 43 adults per 100 plants. (August 22): Some fields in the Brazos River bottoms found heavily infested. Most of the nymphs were on small bolls while adults were generally distributed over the plants, showing a preference for the blooms. Also found on field peas in one place.

COTTON STAINER (Dysdercus suturellus H. S.)

Florida. A. N. Tissot (August 23): A great deal of damage caused on Sea Island cotton at Melbourne. Insect reported to be doing injury to cotton in other parts of the State.

L. C. Fife and C. S. Rude (August 13): Cotton stainer showing up in the lower part of Lake County.

LEAF APHIDS (Aphidae)

South Carolina. F. F. Bondy and C. F. Rainwater (August 27): Numerous in most dusted fields, and causing the shedding of leaves at the bottoms of the plants in Florence County.

Georgia. P. M. Gilmer and P. A. Glick (August 28): Aphids increasing in the Upper Coastal Plain. Some damage to lint in Sea Island cotton likely to occur.

Florida. L. C. Fife and C. S. Rude (August 27): Aphids have built up in the last 2 weeks, especially in fields that have been heavily dusted. Parasites, present in large numbers 3 weeks ago, seem to have disappeared.

Mississippi. C. Lyle (August 24): Infestations of cotton aphid (Aphis gossypii Glov.) heavier this season than for several years owing to control measures for the boll weevil.

Louisiana. C. O. Eddy (August): Unusually abundant on cotton this year, probably owing to such intensive control measures for boll weevil.

M. T. Young and assistants (August 27): Heavy in treated fields and found in greater numbers than usual in untreated fields in Madison Parish.

Oklahoma. E. E. Ivy (August 21): Abundant on cotton all summer in McCurtain County but not much damage apparent.

Texas. F. L. Thomas (August 19): Plants in the greater part of Lubbock County literally covered with plant lice and the resultant honeydew. Leaves are curling and the squares beginning to shed. (August 26): Present in all fields of central Texas where control measures used for boll weevil. Infestation much heavier in some fields than in others, and staining of lint quite likely to occur.

K. P. Ewing, et al. (August 20): Damage continued and easily seen in fields in Galhoun and Jackson Counties, as heavily infested plants have lost their green color in comparison with more lightly infested ones.

Arizona. W. A. Stevenson (July 30): Infestation in Pima County has practically cleared up, owing principally to parasites, but somewhat to predators.

COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker (August 10): Part of a field of cotton near Whaleyville reported as being rather heavily infested.

South Carolina. F. F. Bondy and C. F. Rainwater (August 6): Local infestations in Florence County have disappeared. (August 20): A small infestation found in a field of late cotton.

Louisiana. R. C. Gaines and assistants (August 20): A few red spiders observed in cotton fields in Madison Parish.

FOREST AND SHADE-TREE INSECTS

FALL WEBWORMS (Hyphantria spp.)

- Maine. F. H. Lathrop (August 15): Nests conspicuous on trees and shrubs along the roadsides from central Maine southward. Many unsprayed apple trees infested. Much more in evidence than at any time during the last 4 or 5 years.
- Vermont. H. L. Bailey (August 27): More than usual numbers of fall webworms in all parts of the State.
- Massachusetts. A. I. Bourne (August 24): This pest, ordinarily conspicuous at this time of year, is comparatively scarce.
- Connecticut. N. Turner (August 22): An occasional nest seen along roadsides in the central part of the State.
- New Jersey. E. Kostal (August 15): More abundant than usual on apple and pear at Morganville. Damage moderate.
- North Carolina. R. J. Kowal (August 20): Pest observed as apparently confined to sourwood (Oxydendrum arborescens) in Morrow Mountain State Park. Majority of trees, especially along roadsides, almost completely defoliated. Defoliation apparently most severe at elevations between 600-800 feet.
- Florida. A. N. Tissot (August 23): Insect apparently on the increase. Reported as doing injury to pecans and hickories at Leesburg, and injury rather general on pecans between Gainesville and Jacksonville.
- Ohio. E. W. Mendonhall (August 22): Noticeable on apple and forest trees generally.
- G. A. Runner (August 23): Practically all willows in marl beds covering a wide area near Castalia, north-central Ohio, contain numerous colonies.
- Kentucky. W. A. Price (August 24): Numerous at Richmond and Lexington.
- Tennessee. G. M. Bentley (August 23): Reported on August 19 as infesting a few sumac plants at McMinnville, Warren County.
- Mississippi. C. Lyle (August 24): Reported as generally scattered over the Grenada district, north-central Mississippi, but no damage of importance done.
- Texas. C. B. Nickels (July 24): Webs on pecan and black walnut more abundant at Mason, central Texas, and at Boerne and Fredericksburg, south-central Texas, than in any other season during the last 5 years. Several webs could be collected from a single small tree.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Vermont and Massachusetts. A. F. Burgess (July and August): Killing of a large number of red oaks, defoliated this year for the third time, reported from Vermont. Many trees not refooliating and apparently dead. Considerable number of pupae in a Massachusetts area found to be opened during the first week in July and a high percentage found dead or containing a maggot of a tachinid parasite.

New England and New York. E. P. Felt (August 23): Damage still generally evident on sugar maples in northwestern Connecticut, western Massachusetts, southern New Hampshire, Vermont, and in adjacent areas in New York, also in the Mohawk Valley. A large proportion of the stripped trees in many communities and extensive areas of woodland seriously injured by the outbreak of last spring.

GYPSY MOTH (Porthetria dispar L.)

New England. A. F. Burgess (July and August): Infestation throughout most sections of the New England infested area less than last year. Little or no stripping apparent this season in the Framingham, Mass., district, where many acres were defoliated last year. Many of the new egg clusters much smaller than those noted last year. A large decrease in infestation in the Cape Cod section of Massachusetts. No intense infestation in Greenfield, Mass., section, as in 1937. Several areas heavily defoliated in towns of Hingham and South Weymouth, Mass. Severe outbreak, accompanied by extreme stripping, reported from two sections of Connecticut.

SATIN MOTH (Stilpnotia salicis L.)

New Hampshire. J. V. Schaffner, Jr. (July 25): A rather heavy flight of moths occurred in the vicinity of Plymouth during the night of July 25. Hundreds of the moths clustered on electric light poles in the business section of the town.

A HEMLOCK LOOPER (Ellopiia fiscellaria lugubrosa Hulst)

Idaho. J. C. Evenden (August): The hemlock looper, which in 1937 appeared in epidemic form throughout northern Idaho and western Montana, is again defoliating large forest areas. A marked decline in the severity of this season's infestation is apparent and the epidemic in general is believed to be decreasing. Large percentage of overwintering eggs parasitized.

CECROPIA MOTH (Platysamia cecropia L.)

Indiana. J. J. Davis (August 24): Reported as abundant on cherry at Tipton on August 8. Many specimens sent in from all sections of the northern half of the State during the last month, but in most cases simply because of their unusual appearance.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

New York. M. Kisliuk, Jr. (August 15): Late in July and early in August evergreens, poplars, maples, and locusts observed as completely defoliated. Many reports of damage received from Long Island.

New Jersey. H. W. Allen (August 22): Defoliation of sycamore, in some cases nearly 100 percent, noted on street shade trees in Burlington County.

Georgia. O. I. Snapp (August 9): Unusually abundant on evergreen trees at Fort Valley, central Georgia.

W. H. Clarke (August 10): More abundant than in several years.

Ohio. T. H. Parks (August 20): Quite injurious to ornamental plantings throughout the southern half of the State.

Indiana. J. J. Davis (August 24): Reported on August 19 as defoliating pines at Scottsburg, southeastern Indiana.

Kentucky. W. A. Price (August 24): **Common in many sections of the State.**

Tennessee. G. M. Bentley (August 23): Noticed on arborvitae and juniper in a nursery at McMinnville, Warren County, on July 27.

Mississippi. C. Lyle (August 24): Reported in various sections of the State as abundant on arborvitae and cedar.

Louisiana. C. O. Eddy (August): Reported from a number of sections of Louisiana as being very abundant.

Oklahoma. F. A. Fenton (August 20): Reported in El Reno, Canadian County, west-central Oklahoma.

Texas. R. K. Fletcher (August 22): Injury to evergreens reported from several points in northeastern Texas.

ASH

CARPENTER WORM (Prionoxystus robiniae Peck)

Minnesota. A. G. Ruggles and assistants (August): Abundant on green ash at Fairmont and all along the western border of the State.

Nebraska. M. H. Swenk (August 23): Reported as attacking elm, ash, and hackberry trees in Sheridan County, northwestern Nebraska, on July 23.

BIRCH

BRONZED BIRCH BORER (Agrilus anxius Gory)

Ohio. E. W. Mendenhall (August 15): Killing birch trees in Columbus.

Iowa. C. J. Drake (August 22): Destroying large numbers of cutleaf birch in Des Moines.

BIRCH LEAF MINER (Fenusa pumila Klug)

Vermont. H. L. Bailey (August 27): Reported as plentiful at Dorset, Bennington County, southeastern Vermont.

New England and New York. E. P. Felt (August 23): Generally prevalent over much of southern New England and adjacent areas in New York State.

BOXELDER

BOXELDER BUG (Leptocoris trivittatus Say)

Virginia. W. S. Hough (August 25): Found in great numbers wherever there are boxelder trees around Winchester. Numerous complaints received that the bugs are entering houses and causing home owners much concern.

Indiana. J. J. Davis (August 24): Abundant during the last month in several localities in the northwestern quarter of the State.

A LEAF ROLLER (Cacoecia semifera Walk.)

Colorado. C. R. Jones (August 1): Boxelder leaf roller more prevalent throughout the State than for years. Practically all boxelder trees completely defoliated.

CATALPA

CATALPA SPHINX (Ceratonia catalpae Bdv.)

Maryland. Gertrude Myers (August 24): Catalpa trees along Avery Road, 3 miles east of Rockville, being defoliated.

Ohio. T. H. Parks (August 20): Heavy defoliation reported from ornamental plantings in cities throughout the State.

Mississippi. C. Lyle (August 24): On August 20 several catalpa trees in Grenada County, north-central Mississippi, were observed to be defoliated.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

New England and New York. J. V. Schaffner, Jr. (August 18): Abundant and causing considerable injury to elms, particularly in residential areas, in many localities throughout New England and New York.

Massachusetts. A. I. Bourne (August 24): Causing considerable damage, especially in towns in the eastern part of the State.

New Jersey. C. W. Collins (August 20): Noticeable injury observed in the following towns: Chatham, Morristown, Florham Park, Hanover, Whippany, Pluckemin, Parsippany, and Madison.

Virginia. L. D. Anderson and H. G. Walker (August): Rather abundant on elms in some plantings near Norfolk.

L. G. Baumhofer (July 22): Destroyed a high percentage of the foliage on the elm trees in the city park at Luray. On July 22 the insect was mostly in the adult and pupal stages.

Ohio. E. W. Mendenhall (August 20): Severe injury in certain localities in Columbus. Second brood working now. (August 25): Found at Delaware, north-central Ohio, infesting American elm. Leaves entirely laced. First record of infestation at Delaware.

Indiana. J. J. Davis (August 24): Specimens received from a number of localities in the southern half of Indiana, and observed to be definitely increasing during the last few years.

Kentucky. W. A. Price (August 24): Reported as doing much damage in the vicinity of Lexington early in August.

ELM SAWFLY (Cimbex americana Leach)

Michigan. R. Hutson (August 22): Collected on elm at Lake City, in the northern part of the Lower Peninsula, on August 3.

ELM LACEBUG (Corythucha ulmi O. & D.)

Connecticut and New York. E. P. Felt (August 23): Damage severe on trees growing in woody or brushy areas in western Connecticut and eastern New York.

LARCH

LARCH SAWFLY (Lygacnematus erichsonii Htg.)

Montana. J. C. Evenden (August 13): Insect recorded from the North Fork of the Flathead River, north of Columbia Falls, in 1934. An infestation at Walton, northwestern Montana, some 60 miles to the south, was first recorded this season.

A SAWFLY (Platycampus larivicornis Rohw. & Midd.)

Idaho. J. C. Evenden (August 22): This new species was first observed in 1921, when an outbreak occurred throughout northern Idaho and western Montana. Reported on western larch at Granite, northern Idaho. First reoccurrence of the insect which has been recorded.

LOCUST

LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

Maryland. J. M. Miller (July 26): Feeding on locust leaves between Kenwood and Calvert Beach, Calvert County. (Det. by H. S. Barber.)

North Carolina. B. H. Wilford (August 2): Found severely attacking black locust, mining the leaves, on ridges and upper slopes in the following northwestern counties: Buncombe, Madison, Yancey, Mitchell, Avery, and Henderson.

Tennessee. B. H. Wilford (August 20): Heavy defoliation of black locust trees reported near Tellico Plains, on the North River section of the Cherokee National Forest.

Ohio. E. W. Mendenhall (August 15): Quite serious on locust trees in southeastern Ohio counties, bordering on the Ohio River.

LOCUST TWIG BORER (Ecdytolopha insiticihana Zell.)

Arkansas. P. H. Miller (August 22): Specimens of borers found in twigs of black locust near Greenbrier, north-central Arkansas. (Det. by C. Heinrich.)

MAPLE

GOUTY VEIN GALL (Dasynceura communis Felt)

Ohio. E. W. Mendenhall (August 15): Very bad on the leaves of two hard maple trees at Belpre, Washington County, southeastern Ohio.

T. H. Parks (August 20): Specimens received from several widely separated localities. Considerable defoliation occurred in Jefferson County, eastern Ohio.

E. P. Felt (August 23): Extremely abundant near Steubenville, east-central Ohio, most of the leaves on a very large sugar maple being seriously damaged and dwarfed by the infestation.

Indiana. J. J. Davis (August 24): Reported as common at Crawfordsville and Greencastle, west-central Indiana. Adults had emerged when received on August 20.

GREEN-STRIPED MAPLE WORM (Anisota rubicunda F.)

New Hampshire. J. G. Conklin (August 29): Observed in localities throughout the southern half of the State. Red maple trees entirely defoliated in some places.

Illinois. W. P. Flint (August 24): Causing some defoliation in the north-western part of the State. Work of insect very spotted. Almost complete defoliation of soft maples in a few localities.

Iowa. C. J. Drake (August 22): A number of hard and soft maple trees defoliated in the vicinity of Emmetsburg, northwestern Iowa, early in August.

ELM SPANWORM (Ennomos subsignarius Hbn.)

Maryland. E. N. Cory (August 1): Trees on about 2 acres at Grantsville, Garrett County, approximately 75 percent defoliated.

APHIDS (Aphidae)

North Carolina. B. H. Wilford (August 2): A maple aphid (Neoprociphilus aceris Monell) is more abundant and destructive this season than in the past at Asheville.

Ohio. G. A. Runner (August 23): Norway maple aphid (Periphyllus lyropictus Kess.) present in considerable numbers on maple but not so abundant as in previous years in the Sandusky area.

A SKELETONIZER (Epinotia aceriella Clem.)

Vermont. H. L. Bailey (August 27): Unusually abundant in Hardwick and Greensboro, Caledonia and Orleans Counties, respectively, northeastern Vermont. On some trees 75 percent of the leaves are infested.

OAK

TWIG PRUNER (Hypermallus villosus F.)

Massachusetts. A. I. Bourne (August 24): Conspicuous on oaks, along highways, but not so prevalent as during the last few years.

Michigan. R. Hutson (August 22): Damage in the form of fallen twigs observed on August 5 at Ludington, Howell, and Lansing.

ORANGE-STRIPED OAK WORM (Anisota senatoria S. & A.)

Indiana. G. E. Gould (August 25): Defoliating many oak trees in the northern half of the State.

A LEAF MINER (Lithocolletes conglomeratella Zell.)

Mississippi. C. Lyle (August 24): Damaged oak leaves received from Terry, Hinds County, west-central Mississippi.

GOLDEN OAK SCALE (Asterolecanium variolosum Ratz.)

New York. E. P. Felt (August 23): Reported as very abundant on a chestnut oak at Haverstraw, Rockland County.

A SCALE (Kermes pubescens Bogue)

Iowa. C. J. Drake (August 22): Reported from Sioux City, western Iowa, and Lamont, eastern Iowa. Apparently unusually abundant in the State this year.

PINE

WHITE-PINE WEEVIL (Pissodes strobi Peck)

Massachusetts. E. P. Felt (August 23): Injury reported from near Boston.

Connecticut. E. P. Felt (August 23): Damage reported from here and there in southwestern Connecticut.

SOUTHERN PINE BEETLE (Dendroctonus frontalis Zimm.)

Maryland, Virginia, and North Carolina. W. J. Schoene (August 23): A serious outbreak occurred during the last 12 months over a wide area extending from southern Maryland to eastern North Carolina, with heavy injury near West Point and Franklin, Va. Losses estimated very high. Extremely wet weather during June and July was unfavorable to the insect, so no spread was noted and new injury is difficult to find.

A BARK BEETLE (Pityophthorus sp.)

Massachusetts. A. I. Bourne (August 24): Specimens received from the eastern part of the State, with the report that they were causing serious injury to white pine.

NANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.)

Maryland. C. A. Weigel (July 5): First observed on July 5 on mugho pine at Silver Spring and Beltsville, where it was causing almost 100-percent destruction of tips on ornamental plantings.

SPRUCE BUDWORM (Cacoecia fumiferana Clem.)

Minnesota. R. H. Nagel (July 21): Common in the Minnesota-Ontario border region. About 10 square miles of jack pine on the Cut Foot Sioux Ranger District, Chippewa National Forest, heavily infested.

PANDORA MOTH (Coloradia pandora Blake)

Colorado. N. D. Wygant (August 1): A heavy flight of moths during July from the infestation on the Arapahoe National Forest observed at Granby, north-central Colorado. Moths spread over a much larger area and thousands of females were attracted to lights in the nearby towns. Eggs have not started to hatch.

PINE BARK APHID (Pineus strobi Htg.)

Ohio. E. W. Mendenhall (August 11): Found in a nursery at Gahanna, Franklin County, on white pine.

SCOTCH PINE LECANIUM (Toumeyella numismaticum P. & McD.)

Michigan. R. Hutson (August 22): Numerous on jack pine at Kenton, in the western part of the Upper Peninsula, on August 4.

A PINE SCALE (Physokermes insignicola Crawf.)

Texas. R. K. Fletcher (August 22): Loblolly pine attacked in Brazos County.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch).

Nebraska. M. H. Swenk (August 23): Inquiry as to control sent from Scotts Bluff County, western Nebraska, on August 8.

POPLAR

COTTONWOOD BORER (Plectrodera scalator F.)

Oklahoma. N. D. Wygant (August 22): Extensive damage being done to cottonwood in the United States Forest Service plantings in western Oklahoma. Trees from one to several years old are infested. Heavily infested trees break off in the wind.

SPRUCE

SPRUCE BUD SCALE (Physokermes piceae Schr.)

Michigan. R. Hutson (August 22): Spruce bud scale received from Birmingham, southeastern Michigan, on August 7.

SPRUCE MITE (Paratetranychus uniunguis Jacobi)

Pennsylvania. H. E. Hodgkiss (August 25): Reported as causing damage in various places.

SUMAC

CATERPILLARS (Datana sp.)

Missouri. L. Haseman (August 24): Early in August complaints and specimens of caterpillars feeding on sumac were received. Field check-up at Columbia indicated wild sumac as infested by the same caterpillar. On August 24 caterpillars had just completed their feeding and were pupating.

A GALL (Pemphigus rhois Fitch)

Massachusetts. A. I. Bourne (August 24): Specimens of sumac received on August 18 from Williamstown, northwestern Berkshire County, showing the presence of this gall. Practically all insect specimens found to bear wing pads, indicating that they were nearly ready for emergence.

SYCAMORE

PLANETREE LACEBUG (Corythucha ciliata Say)

Connecticut and New York. E. P. Felt (August 23): Very prevalent in western Connecticut and in the lower part of the Hudson River Valley.

WILLOW

LEAF BEETLES (Chrysomela spp.)

Ohio. E. W. Mendenhall (August 20): Spotted willow leaf beetle (C. interrupta F.) injurious on willow stock in a nursery at Zanesville, Muskingum County.

Nebraska. M. H. Swenk (August 23): Cottonwood leaf beetle (C. scripta F.) found attacking cottonwood trees in Garden County, western Nebraska, on July 29, and in Pierce County, northeastern Nebraska, on August 1.

EUROPEAN WILLOW LEAF BEETLE (Plagiodera versicolora Laich)

New England and New York. E. P. Felt (August 23): Damage somewhat generally abundant, and here and there seriously injurious to willows in southern New England and southeastern New York.

POPLAR TENTMAKER (Ichthyura inclusa Hbn.)

Ohio. E. W. Mendenhall (August 15): Found infesting willow trees in a nursery at Columbus, doing some damage.

WILLOW-GROVE APHID (Melanoxantherium smithiae Monell)

Ohio. E. W. Mendenhall (August 19): Quite injurious and annoying on weeping willow trees at Crooksville, Perry County. (August 25): Found infesting weeping willow trees at Delaware, north-central Ohio.

INSECTS AFFECTING GREENHOUSE
AND ORNAMENTAL PLANTS

HAIRY CHINCH BUG (Blissus hirtus Montd.)

- Connecticut. J. P. Johnson (August 22): Infestations in lawns more prevalent this year than last. Reported as occurring in New Haven, Hamden, Shelton, West Haven, Bridgeport, Westport, and Hartford.
E. P. Felt (August 23): Causing some injury to lawns at Stamford.
- New York. N. Y. State Coll. Agr. News Letter (August 22): Chinch bugs are at the height of their infestation now in eastern New York. They have been brought out in great numbers by hot weather.
- Pennsylvania. H. E. Hodgkiss (August 25): The hairy chinch bug is causing serious damage on a number of golf courses throughout the State.
- Florida. A. N. Tissot (August 23): A chinch bug (B. insularis Barber) reported as doing quite a bit of damage in St. Augustine grass lawns at Gainesville. Also reported from Haines City.

GARDEN FLEA HOPPER (Halticus citri Ashm.)

- Indiana. J. J. Davis (August 24): Very abundant and damaging ornamental perennials and annuals in central Indiana.

A TREEHOPPER (Enchenopa binotata Say)

- Michigan. R. Hutson (August 22): Eggs on bittersweet reported from Goodrich on August 15.

WHITE PEACH SCALE (Aulacaspis pentagona Targ.)

- Virginia. H. G. Walker (August): We have continued to receive quite a number of calls for information on the control of this scale, which has been attacking a wide variety of trees and shrubs.
- South Carolina. F. Sherman and W. C. Nettles (August 22): Several specimens of this scale on mulberry from various localities.

OYSTERSHELL SCALE (Lepidosaphes ulmi L.)

- New Hampshire. J. V. Schaffner, Jr. (August 19): Heavy infestation reported on beech trees in Sullivan County.
- Indiana. J. J. Davis (August 24): Reported as killing lilac in central and northern Indiana and as attacking other shrubs and trees.

A WASP (Chlorion ichneumoneum L.)

- Indiana. J. J. Davis (August 24): Reported in a number of places as boring holes in lawns during the latter part of July and the first of August

in central Indiana. In one instance observed dragging crickets and grasshoppers into holes dug in the ground by them.

STRAWBERRY ROOT WEEVIL (Brachyrhinus ovatus L.)

Ohio. E. W. Mendenhall (August 5): Found girdling the tender shoots of the arborvitae trees in the nursery at Zanesville. (August 18): Some damage from girdling of trees in nursery at Zanesville. Strawberry plantation nearby.

Michigan. R. Hutson (August 22): Reported as entering houses at South Haven on July 24, and at Frankfort and Whitehall on July 26.

Washington. M. H. Hatch (July 30): Considerable numbers of the two species (B. ovatus and B. sulcatus F.) reported in a house at Bremerton.

AZALEA

AZALEA SCALE (Eriococcus azaleae Comst.)

Mississippi. N. D. Peets (August 24): Infestation of this scale found on August 5 on azalea plants in McComb, Pike County, south-central Mississippi.

AZALEA LACEBUG (Stephanitis pyrioides Scott)

New York. E. P. Felt (August 23): Extremely abundant and injurious to azaleas in Scarsdale.

CRAPEMYRTLE

CRAPEMYRTLE APHID (Myzocallis kahawaluokalani Kirk.)

Georgia. T. L. Bissell (August 22): Very abundant and the plants heavily laden with moldy honeydew at Griffin, northwestern Georgia. No injury to foliage observed.

DAHLIA

SUNFLOWER WEEVIL (Rhodobaenus tredecimpunctatus Ill.)

Louisiana. C. A. Weigel (June 29): Reported as boring into the bulbs of dahlias at Pineville, where a few were found in one field. (Det. by L. L. Buchanan.)

DOGWOOD

SAWFLIES (Macremphytus spp.)

Pennsylvania. H. E. Hodgkiss (August 25): Larvae of two sawflies (M. varianus Nort. and M. tarsatus Say) defoliated dogwood generally during August.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

- New York. R. E. Horsey (August): A serious pest in Rochester. On August 14 observed a large mass of Euonymus radicans vegetus, which had been cut out of a private yard and thrown out, almost completely covered with this scale, young leaves and branchlets as well as old stems.
- Georgia. T. L. Bissell (August 24): Twigs and leaves of euonymus heavily infested with this scale at Barnesville, central Georgia.
- Mississippi. C. Lyle (August 24): On August 20 this scale reported as abundant on euonymus plants at Canton in Madison County, central Mississippi. Leaves showing a heavy infestation of scale received on August 4 from Brookhaven, in Lincoln County, southwestern Mississippi.
- Texas. R. K. Fletcher (August 22): Reported from Ellis and Smith Counties.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

- Ohio. E. W. Mendenhall (August 22): Generally very destructive on gladiolus plants, especially where treatments have not been given.
- Indiana. J. J. Davis (August 24): Reports of serious damage received from all parts of the State.

IRIS

IRIS BORER (Macronoctua onusta Grote)

- Indiana. J. J. Davis (August 24): Very common throughout the State.
- Iowa. C. J. Drake (August 22): Reported as damaging iris plantings in Cedar Rapids, east-central Iowa.

IVY

MARGINED BLISTER BEETLE (Epicauta marginata F.)

- North Carolina. C. S. Brimley (August 18): Our first record of this species on Hedra helix. Made at Southern Pines, central North Carolina, where it was damaging ivy severely. It is most commonly complained of on Clematis paniculata which it often completely defoliates.

JUNIPER AND CEDAR

JUNIPER WEBWORM (Dichomeris marginellus F.)

- Ohio. E. W. Mendenhall (August 11): The juniper webworm is doing some injury in a nursery and cemetery south of Columbus.

JUNIPER SCALE (Diaspis carueli Targ.-Tozz.)

Pennsylvania. H. E. Hodgkiss (August 25): Juniper scale very abundant.

Michigan. R. Hutson (August 22): Young scales just establishing themselves on juniper in Highland Park, southeastern Michigan, on August 2. Winged males present.

CEDAR BARK BEETLE (Phloeosinus cristatus Lec.)

Nebraska. M. H. Swenk (August 23): Reported as attacking cedar trees in Hamilton County, southeastern Nebraska, on August 2.

PRIVET

THRIPS (Thysanoptera)

Connecticut. E. P. Felt (August 23): Privet thrips (Dendrothrips ornatus Jabl.) causing some injury at Stamford.

Indiana. J. J. Davis (August 24): Thrips (species unknown) very abundant on privet at La Fayette and elsewhere, and appreciably damaging the foliage.

RHODODENDRON

A LACEBUG (Tingidae)

North Carolina. B. H. Wilford (August 2): Found very destructive on Rhododendron catawbiense in a commercial nursery at Pincola.

ROSE

A BEETLE (Carpophilus pallipennis Say)

Colorado. C. R. Jones (August 1): Very prevalent throughout the State in all types of blossoms, and doing considerable damage in rose gardens.

SPIREA

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana Walk.)

Ohio. T. H. Parks (August 20): Found feeding on spirea plants in a nursery at Columbus, and destroying foliage. Also quite a pest of apple.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MAN :

MOSQUITOES (Culicinae)

Vermont. F. C. Bishopp (August 25): According to H. L. Bailey, very few mosquitoes around Lake Dunmore this summer. One of the late records for the appearance of Aedes cinereus Meig. was August 7. (Det. by A. Stone.)

Massachusetts. A. I. Bourne (August 24): Veritable scourge of mosquitoes brought about by the unusually heavy and frequent rains in July. Complaints of their abundance from all parts of the State.

Connecticut. A. W. Morrill, Jr. (August 1): Mosquitoes, apparently Culex spp., have been extremely prevalent in the Hartford area for the last week, during an unusually hot and humid period. Following a period of extreme rains the insects appeared in swarms. They are stated to be more numerous and more persistent in entering houses than at any time within recent years. Although normally they will not attack except at dusk, they have been present at all times of the day. Screens which have been in past years quite adequate for keeping them out of the house have failed this year completely.

New Jersey, Delaware, and Maryland. G. H. Bradley, W. A. Connell, and J. A. Rowe (August): Large broods of A. sollicitans Walk. emerged following heavy rains during the middle and latter part of July and caused mosquito infestations in both inland and resort towns in southern New Jersey, Delaware, and eastern Maryland. Brood of late July particularly large and annoying during the first 2 weeks of August. In southern New Jersey although A. sollicitans was the predominating species, considerable numbers of A. vexans Meig. were also present.

Illinois. F. C. Bishopp (August 1): Reports received of the appearance of large numbers of the shaggy-legged gallinipper (Psorophora ciliata F.) during late July. Very annoying to man in manufacturing plants near the river bottoms.

California. F. C. Bishopp (August 25): In late July 103 mosquitoes taken in 1 trap in 1 day at Fresno by P. Simmons. Mosquitoes reported as being annoying in the vicinity.

BAT BUG (Cimex pilosellus Horv.)

Delaware. E. A. Back (July 26): Found in ruffles of curtain at window, in bed close to window, and on upholstered chair in living room in home near Newark. No biting of occupants reported. (Det. by H. G. Barber.)

CHIGGER (Trombicula irritans Riley)

New Jersey. T. H. Jones (August 20): There have been a number of complaints of chiggers.

Indiana. J. J. Davis (August 24): Chiggers were very annoying throughout most sections of the State during August.

Iowa. C. J. Drake (August 22): Complaints of unusual abundance of chiggers received from Burlington, southeastern Iowa, Sioux City and River Sioux, western Iowa, and Dubuque, eastern Iowa.

EYE GNATS (Hippelates spp.)

Maryland. F. C. Bishopp (August 25): These gnats present in considerable numbers throughout August around dogs, and occasionally annoying to man.

TROPICAL RAT MITE (Liponyssus bacoti Hirst)

South Carolina. W. C. Nettles (August 22): One case of rat mite affecting man has recently come to our notice. (Det. by F. C. Bishopp.)

SADDLE-BACK CATERPILLAR (Sibine stimulea Clem.)

Indiana. J. J. Davis (August 24): Sent in repeatedly from the southern two-thirds of Indiana, the first report being dated August 3, and reports received up to the present. In many cases reported as feeding on corn, but in most cases refer to having been bitten or stung by this caterpillar. More reports received this year than any year during the last 18.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Maryland, Virginia, and District of Columbia. F. C. Bishopp (August 24): This tick quite scarce in the District and nearby Maryland, as is usual at this date. The third death from Rocky Mountain spotted fever in Montgomery County today. (August 29): A recent report by Dr. C. H. Halliday, of the Maryland Department of Health, states that there have been 33 cases of Rocky Mountain spotted fever with 11 deaths reported so far this year in Maryland. This is a higher mortality than last year, when 7 deaths and 35 cases were reported. Montgomery, Anne Arundel, Baltimore, and Prince Georges Counties showed the largest number of cases. The number of cases of spotted fever in Virginia appears to be about normal, though complete reports are not available. Seventeen cases were reported the first 2 weeks of August.

J. A. Hyslop (August 28): A fully engorged tick was taken from a dog at Silver Spring, Md., today. A tick only slightly attached to a person on August 27 was reported from near Rockville, Md.

Virginia. L. D. Anderson and H. G. Walker (August): Ticks have been reported as very abundant in a dog kennel at Norfolk.

Georgia. A. L. Brody (August 20): Very few specimens of dog tick seen on sheep and cattle during the last month. No dogs examined.

ORIENTAL RAT FLEA (Xenopsylla cheopis Rothsch.)

Ohio. F. C. Bishopp (August 25): "A regular plague of these fleas" biting and otherwise causing considerable discomfort to workers in the offices of a manufacturing plant at Youngstown, was reported by E. A. Berglund. Rats are abundant in the vicinity. (Det. by H. E. Ewing.)

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

South Carolina. F. C. Bishopp (August 25): Specimens from a hog at Clemson College on August 15. E. G. Godbey writes that this was the first case of screwworms at the College and the first heard of in that section of the State. Since then one sheep and one cow infested. No other definite records received from South Carolina this year.

J. G. Watts (August 10-25): One case reported as resulting from a wound on a cow at Fairfax.

Georgia. A. L. Brody (August 20): True screwworm only slightly active in the vicinity of Valdosta during the last month. Heavy infestations reported from Quitman and from Hahira. Sixty-one cases collected in the vicinity of Valdosta from the week beginning on July 16 through August 20, found on both natural and artificial wounds.

Florida. S. E. Shields (August 22): Complaints of screwworm frequent during the last month. Average number of treatments per day, for the last month, five or six, and many severe infestations in mouths of livestock. Numerous deaths from screwworm.

A. L. Brody (August 20): At least 50 cases of screwworm reported in 535 head of cattle in Hendry County. Greater number of cases in the cars, which were heavily infested with the Gulf coast tick.

F. S. Chamberlin (August 12): A moderate infestation of screwworms in livestock reported in the Gadsden County area.

Alabama. J. M. Robinson (August 1): True screwworm attacking cattle at Comer, southeastern Alabama.

Oklahoma. F. A. Fenton (August 20): True screwworms at Bartlesville, Washington County.

Texas. R. Melvin (August): Following the heavy rains in Menard and adjoining counties, conditions apparently very favorable for the propagation of the screwworm flies, C. americana and C. macellaria F. These species very abundant in the vicinity of Menard.

STABLEFLY (Stomoxys calcitrans L.)

Maryland and District of Columbia. F. C. Bishopp (August 24): Unusually abundant and annoying to man and animals in the District of Columbia and nearby Maryland. People complain of being bitten, horses are much worried, and in many cases the ears of dogs are raw from the attack.

HORN FLY (Haematobia irritans L.)

Georgia. A. L. Brody (August 20): Not so numerous as during June and July. Flies average about 100 per animal.

Florida. A. L. Brody (August 20): Present in immense numbers at Brooksville on August 9. Flies covered some of the animals like a blanket. Many animals showed considerable injury on the underparts of the body. Very few horn flies observed in Hendry County, 15 miles south of Immokalee.

GULF COAST TICK (Amblyomma maculatum Koch)

Georgia. A. L. Brody (August 20): As noted at the experimental farm on check animals, in the vicinity of Valdosta, a slight decrease found in the number of ticks of this species during the last month.

Florida. A. L. Brody (August 20): At least 85 percent of a herd of 535 cattle reported as infested with mild to heavy infestations. Cattle pastured in Hendry County and examined about 15 miles south of Immokalee. Gulf coast tick also reported as appearing in Highlands County but not doing great damage.

Mississippi. C. Lyle (August 24): Ticks taken from a cow at Kreole, Jackson County, southeastern Mississippi, and from cows and sheep at Lucedale, George County, just north of Jackson County.

HORSE

THROAT BOTFLY (Gastrophilus nasalis L.)

Iowa. R. W. Wells (August 23): After a lapse of activity at Ames during the last two weeks of July, this pest resumed activity about August 10, and by August 19 was more active than during the early part of the summer, judging by the number of eggs obtained on egg traps exposed on horses.

DOG

BROWN DOG TICK (Rhipicephalus sanguineus Latr.)

Maine. F. C. Bishopp (August 25): Specimen from Orono, furnishing the first record for Maine and the second for New England.

Georgia. A. L. Brody (August 20): An exceedingly heavy infestation of this tick found on a dog at Valdosta, July 28.

GOAT

SHEEP BOTFLY (*Oestrus ovis* L.)

Georgia. A. L. Brody (August 20): During the last month 23 goat heads examined, of which 15 had nose bots in some external head cavity. Most of the larvae found in first stage and half-grown second stage. A few found on August 18 were full-grown third-stage larvae.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

ANTS (Formicidae)

Pennsylvania. Mrs. C. Mullery (August 16): Ants (*Monomorium pharaonis* L.) found infesting a house in Philadelphia. (Det. by R. A. Cushman.)

District of Columbia. E. A. Back (August 15): Ants (*Camponotus herculeanus pennsylvanicus* Deg.) collected in the northwestern section of the city of Washington. (Det. by R. A. Cushman.)

Mississippi. C. Lyle (August 24): Specimens of *M. pharaonis* were recently received from correspondents at Columbus in Lowndes County and West Point in Clay County with the report that they were causing annoyance in houses. Both locations are in east-central Mississippi. Inspector J. Milton reported on August 20 that he found fire ants (*Solenopsis xyloni* F.) causing serious damage to dahlia plants in Jackson, Hinds County. Specimens of this species have also been received from correspondents at Tupelo in Lee County, northeastern Mississippi, and Brookhaven in Lincoln County, with reports that they were abundant in houses, yards, and gardens. Lincoln and Hinds Counties are in the southwestern part of the State. An ant (*Solenopsis molesta* Say) was found in a kitchen in Starkville, Oktibbeha County, east-central Mississippi.

Ohio. E. A. Back (July 8): Ants (*Tetramorium caespitum* L.), winged forms, received from Cincinnati where they were infesting basement of dwelling. (Det. by M. R. Smith.)

Oregon. S. C. Jones (August 16): Ants (*Pogonomyrmex occidentalis* Cress.) sent in for identification with the report that they were doing serious injury to peach trees near Halfway, Baker County, northeastern Oregon. (Det. by R. A. Cushman.)

A WASP (*Polistes fuscatus variatus* Cress.)

Nebraska. M. H. Swenk (August 23): Reported present in Knox County on August 8 and 15 in such numbers at and over a stock watering tank that

neither people nor livestock could come near the tank without getting stung. Over 300 wasps killed in one day. Similar complaint from Douglas County on August 12 and one from Gage County on August 14.

A WASP (Trypoxylon clavatum Say)

Maryland. F. C. Bishopp (August 1): Two specimens sent in on July 29, collected at Silver Spring from holes in clapboards in house. (Det. by G. A. Sandhouse.)

BROWN-BANDED COCKROACH (Supella supellectilium Serv.)

Ohio. M. W. Smith (August 6): Reported from Columbus, in a private home in Bexley, a suburb. Several specimens of each sex collected. This is the first infestation in this immediate vicinity that I know of.

HOUSE CRICKET (Gryllus domesticus L.)

Connecticut. E. A. Back (July 28): Specimens received from houses in Waterbury, where they were reported to be abundant and destroying clothing.

Pennsylvania. E. A. Back (July): Specimens received from owner of house who claims that they emerged at night on all floors, including basement and attic, and that they were damaging clothing. Killed as many as 50 in one evening.

Ohio. T. H. Parks (August 20): Specimens from Hamilton and Portsmouth. Developed in waste material of city dumps and have spread to nearby homes.

F. C. Bishopp (August 5): Troublesome household pest near a dump in Dayton.

Indiana. J. J. Davis (August 24): Reported as annoying in homes in several points in southern and central Indiana.

EUROPEAN EARWIG (Forficula auricularia L.)

Rhode Island. J. V. Schaffner, Jr. (August 1): Abundant in some localities in the vicinity of Newport during July.

Massachusetts. J. V. Schaffner, Jr. (August 1): Abundant in some localities in the vicinity of Taunton during July.

New York. E. A. Back (July 23-August 4): Troublesome in homes and gardens in Rochester. (Det. by A. B. Gurney.)

RING-LEGGED EARWIG (Euborellia annulipes Lucas)

Mississippi. C. Lyle (August 24): Hundreds of earwigs were observed on August 16 around a silage cutter on a farm in Jackson County. Apparently brought in from the fields on green corn and soybeans.

BARKLICE (Psocidae)

New Hampshire. J. G. Conklin (August 29): Psocids (Corastinusocus venosus Burn.) appeared in unprecedented numbers in all parts of the State.

Connecticut. E. A. Back (July 18): Psocids (Psocus sp.) in numbers in winged form at Money Island, Stony Creek, in unfinished attic of shore cottage, recently shingled, shaded by overhanging trees. (Det. by A. B. Gurney.)

Colorado. E. A. Back (August 1): Psocids overrunning damp basement library in a private home in Denver. House 2 $\frac{1}{2}$ years old with bookcases adjoining walls. Psocids appeared soon after books were placed in the basement. House fumigated three times, and 2 days after last fumigation, July 29, the psocids were in evidence, apparently coming in from outside via open windows, as most abundant nearest to windows.

SPRINGTAILS (Sira spp.)

New York and Pennsylvania. E. A. Back (July 19): Springtails, probably Sira buski Lubbock, numerous about window sills and in an apartment in Upper Manhattan, New York City, N. Y. Springtails, Sira platani Lubbock, collected about windows of house in Philadelphia, Pa. (Det. by C. F. W. Muesebeck.)

BETTERLES (Coleoptera)

United States. E. A. Back (July and August): Odoriferous beetle (Nomius pygmaeus Dej.) invaded houses and hotels in Portland, Oreg., in numbers sufficient to cause newspaper comment on July 23. Appearance in houses stated to have followed a rather dry summer and correspondent refers to similar appearance which came to his attention 34 years ago when the insect was identified by Dr. L. O. Howard. Specimens of a dermestid (Thylodrias contractus Mots.) troublesome in home in Chicago, Ill., July 10. Hide beetle (Dermestes vulpinus F.) abundant in general market store in Washington, D. C., on August 9, developing upon meat scraps allowed to collect in sawdust beneath a wooden, slatted platform over cement floor. Mature larvae migrating about store, burrowing into cartons of rice, cakes of soap, and other commodities, and honeycombing shelving and supports of meat blocks. Furniture carpet beetle (Anthrenus vorax Wtrh.) from Belgrade, Yugoslavia, July 21, where they were damaging wool clothing. Specimens alive when examined in Washington, D. C. On August 5 same species was found abundant in all stages in an upholstered piece of furniture in a house, Washington, D. C. Coninomus constrictus Gyll. is abundant in adult form in a newly constructed apartment building, July 13, in New York City. The same species found abundant on July 25 in a house in Missouri built in 1936. Beetles first noticed about 14 months ago. House fumigated in August 1937 with apparently satisfactory results. Beetles returned in force in July 1938 and continually becoming more numerous. Numerous specimens of Mycetophagidae (Typhaea stercoraria L.) received from Indianapolis, Ind., July 6, where they were found in a house.

Georgia. O. I. Snapp (August 11): The cadelle (Tenebrioides mauritanicus L.) has damaged wheat stored in a warehouse at Fort Valley, central Georgia.

Michigan. J. J. Davis (August 1): Beetles (Leperisinus aculeatus Say) originally from Detroit, sent in by a Mr. Stover. Reported that they were abundant in the basement of a home. (Det. by M. W. Blackman who states that they nearly certainly emerged from ash wood stored in basement.)

Illinois. T. E. Snyder (August 2): A cossonid (Hexarthrum ulkei Horn) found damaging the woodwork of buildings in Chicago. (Det. by L. L. Buchanan.)

Texas. C. Eagleson (July 19): Bostrichid (Schistoceros hamatus F.) adults reared at Dallas from larvae burrowing in cedar cigar box and, incidentally, causing injury to cigars packed within box. (Det. by W. S. Fisher.)

Washington and Oregon. H. H. Stage (July 29): Several inquiries have been made regarding Nomius pygmaeus Dej., the malodorous ground beetle, within the last 2 weeks. Has been reported in gardens, dwellings, and apartments in Shelton and La Grande, Wash., and Portland, Oreg. Seems to be attracted to lights during evening. (Det. by R. L. Furness.)

California. P. Simmons (July 20): The infestation of a house at Fresno by Oryzaephilus surinamensis L., the saw-toothed grain beetle, crawling from raisin stemmer trash was reported today by telephone. The trash, to be used as fertilizer, has been on the premises of a neighbor for about a week. A similar report was investigated in 1937.

BOOKLOUSE (Troctes divinatorius Mull.)

Maryland. F. C. Bishopp and E. C. Cushing (August 4): Collected on books, August 3, at Silver Spring. (Det. by A. B. Gurney.)

SOWBUGS (Crustacea)

Ohio. F. C. Bishopp (August 5): Sowbugs (Porcellio laevis Latr., Porcellionides pruinosus Brdt., and Armadillidium vulgare Latr.) reported from Dayton as everywhere by the millions in the houses, especially in the basements. The walls are actually covered thick with them. They are 3 or 4 inches deep in the furnace pipes, and houses smell like dead animals. Area most affected near a dump. Reported by R. K. Barnett. (Det. by J. O. Maloney.)

INSECT PEST SURVEY BULLETIN

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Supplement to Number 7

September 20, 1938

Hessian Fly Survey at Harvest-time, 1938

Field surveys made by the Bureau of Entomology and Plant Quarantine field stations at Manhattan and Wichita, Kans., Lafayette, Ind., and Carlisle, Pa., and the State agricultural experiment stations of Illinois, Ohio, Oklahoma, and Nebraska indicate that hessian fly populations are from low to moderate in Nebraska, Kansas, Oklahoma, Missouri, and Illinois, the southern half of Indiana, central Ohio, Kentucky, Tennessee, western and south-central Pennsylvania, Maryland, Delaware, and Virginia. However, there are menacing populations of flies in local fields and areas in most of these States or districts.

Marked increase of the hessian fly has occurred throughout the northern half of Indiana and the northwestern counties of Ohio. Adherence to the safe seeding dates is particularly advisable for these districts.

Slight-to-moderate increases of fly infestations are recorded for central Ohio, eastern and northern Pennsylvania, northwestern and south-central Virginia, and north-central North Carolina, with moderate-to-severe infestations likely to occur in the fall of 1938 in Pennsylvania and North Carolina.

The summarized data below and the accompanying map indicate more fully the regions covered by the survey and the general trend of fly infestations. A field sample in the survey usually consisted of 50 wheat stems.

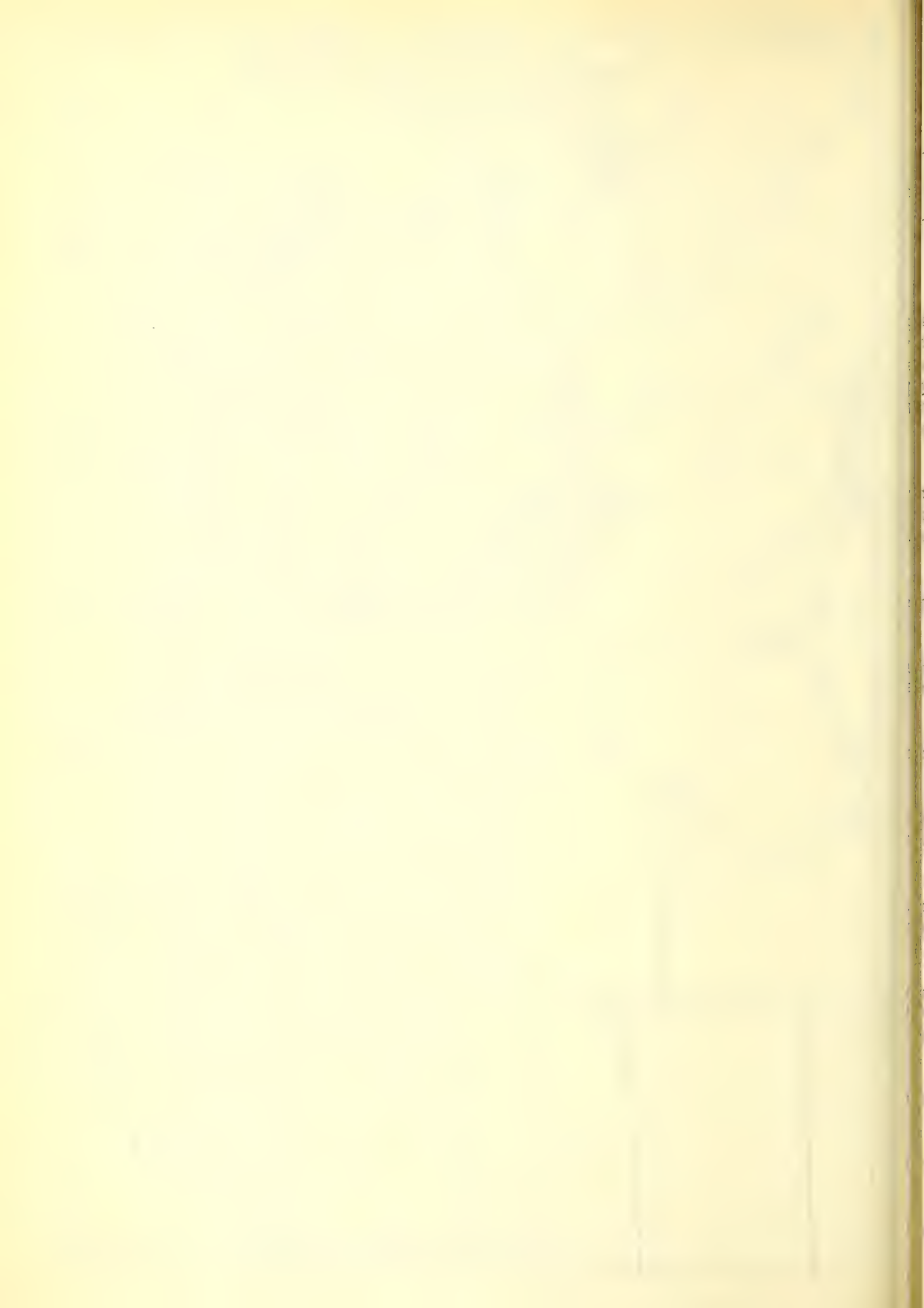
Area	Fields sampled Number	Stems infested		
		Average	Maximum	Minimum
		Percent	Percent	Percent
Nebraska:				
Southwestern -----	3	0	0	0
South-central -----	27	0	2	0
Southeastern -----	84	0	6	0
Kansas:				
Northwestern -----	18	0	0	0
North-central -----	40	0	4	0
Northeastern -----	45	3	56	0
South-central -----	40	1	26	0
Southeastern -----	37	5	28	0
Oklahoma:				
Northwestern -----	19	1	2	0
North-central -----	28	0	2	0
Northeastern -----	37	1	10	0
Missouri:				
Northwestern -----	19	1	2	0
North-central -----	28	0	2	0
Northeastern -----	37	1	10	0
Illinois: ^{1/}				
Western, central, and eastern --	--	7	--	--
Southern -----	--	2	--	--
Michigan:				
Southwestern -----	16	3	14	0
South-central -----	15	23	52	0
Central (south) and southeast- ern -----	17	1	2	0
Indiana:				
Northern and central (north) --	162	22	86	0
Eastern, central (south), southern, and western -----	189	5	30	0
Southwestern -----	42	11	46	0

^{1/} Mostly from survey by State entomologists.

Area	Fields	Stems infested		
	sampled	Average	Maximum	Minimum
	Number	Percent	Percent	Percent
Ohio ^{1/}				
Northwestern, north-central and:				
central (north) -----	2/145	16	--	--
Western and central (south) ---	2/141	8	--	--
East-central -----	2/ 50	1	--	--
Kentucky:				
Western -----	25	5	26	0
East-central -----	34	2	18	0
Tennessee:				
West-central -----	54	1	28	0
Eastern -----	67	1	16	0
Pennsylvania:				
Western -----	15	1	6	0
North-central -----	20	11	40	0
South-central -----	35	6	58	0
Eastern -----	25	16	90	0
Delaware -----	10	6	30	0
Maryland:				
Western -----	25	4	24	0
Eastern -----	15	4	10	0
Virginia:				
Northwestern -----	25	9	42	0
Northeastern -----	30	4	12	0
South-central -----	15	7	40	0
North Carolina:				
North-central -----	40	10	54	0

^{1/} Mostly from survey by State entomologists.

^{2/} Approximate.



THE MORE IMPORTANT RECORDS FOR SEPTEMBER

The grasshopper Dissosteira longipennis Thos. was doing considerable damage in Oklahoma late in September and eggs were being laid in the Panhandle of that State. The differential grasshopper seems to be more numerous than usual in parts of Arizona. The populations resulting from great flight of Melanoplus mexicanus Sauss. into eastern Montana have been materially reduced by disease, predators, and parasites. Certain areas of eastern Oregon are recording heavy egg laying by Camnula pellucida Scudd.

While the Mormon cricket control program this year was conducted as a crop-protective measure, it has resulted in greatly reducing populations in a number of large areas. A general reduction in population has, we believe, resulted in all States in which control was conducted this year.

The infested area in Oregon, North Dakota, South Dakota, and Nebraska is more extensive than it was last year.

A general increase in Japanese beetle population is reported from the northern part of the infested area of New England, while in the central area in New Jersey numbers are below normal.

The oriental beetle has increased in northern New Jersey and southwestern Connecticut.

The Asiatic garden beetle has decidedly increased in numbers in northern New Jersey, southwestern Connecticut, in the Philadelphia area of Pennsylvania, and in Washington, D. C.

Fuller's rose beetle did considerable damage from North Carolina south and westward to Louisiana. It was observed on tung-oil trees in Alabama and Louisiana.

In general the hessian fly situation is not serious. However, threatening populations are reported from northern Indiana, northwestern Ohio, and southeastern Pennsylvania. The results of a fall survey are published in Supplement to No. 7, Insect Pest Survey Bulletin, September 20, 1938.

Late damage by corn ear worm is reported throughout the Southeastern and East Central States.

Very serious outbreaks of the fall armyworm are reported from New England, Middle Atlantic, South Atlantic, and Mississippi Valley States.

Damage by European corn borer was reported from New England, New York, Indiana, and Ohio.

One of the heaviest infestations of the corn leaf aphid in the last 22 years was reported from Wisconsin, with reports of heavy damage also from Minnesota and Nebraska.

The vetch bruchid has been discovered in the important seed-producing sections of Oregon, with indications that it is also established in southwestern Washington.

An outbreak of the sorghum webworm is reported from Arkansas and northern Texas.

Heavy infestation of the codling moth is reported from Virginia.

Damage by the apple maggot to both apples and blueberries increased in Maine.

Rather heavy infestations of citrus by whiteflies were reported as extending from Georgia and Florida to Louisiana.

The banded cucumber beetle did serious injury to a variety of truck crops from South Carolina around the Gulf to Texas.

Damage by the potato tuber moth to potatoes is reported from North Carolina and Louisiana; also considerable damage by this insect to tomatoes in California.

The tobacco moth was found injuring tobacco in pack houses on farms in Pittsylvania County, Va., and Rockingham, Forsyth, Durham, and Caswell Counties, N. C.

Mexican bean beetle did some damage in Connecticut and New York. More severe damage was reported from North Carolina southward to Florida and westward to Ohio and Tennessee.

Pickle worm injury to late cucurbits is reported from South Carolina and Missouri.

Flights of the cotton leaf worm moth into New England, New York, Pennsylvania, Ohio, Indiana, and Michigan occurred throughout September. In the Southern States extensive defoliation and ragging of cotton is reported to be general.

The fall webworm was generally abundant from Connecticut to Florida and Mississippi.

A very heavy infestation of walkingsticks was reported from Carbon County, Pa.

A sawfly, Diprion frutetorum F., was collected in New Jersey. This is apparently the first record of damage by this insect, which is a pest of pine, in the United States.

An outbreak of screwworms was reported from north-central Illinois and damage was also reported from scattered localities in the west-central part of the State.

The outbreak of the spruce budworm on jack pine in southern Manitoba and northwestern Ontario has apparently increased and spread considerably in 1938, and new areas of infestation have been reported. Hundreds of miles of forest showed a solid red from the air, owing to the work of these insects, and considerable tree mortality undoubtedly will result.

Field investigations on the hemlock looper in the interior of British Columbia indicate that the larvae were less abundant than in 1937, and there was a high degree of parasitization. About 40 percent of the hemlock was killed at Trout Lake and near Golden, as a result of the outbreak. These are the first outbreak records of Ellopiia fuscicollis Guen., from the interior of the Province.

The larch sawfly continues to be abundant in many parts of the Provinces of eastern Canada. Sporadic outbreaks are present in Manitoba. Another species of sawfly, Anoplonyx laricis Marlatt, was found to be widespread on larch in southern Manitoba and in western Ontario, north of Lake Superior, but was apparently not injurious. Light infestations were reported in southern Ontario.

THE MORE IMPORTANT ENTOMOLOGICAL FEATURES IN CANADA FOR AUGUST AND SEPTEMBER

The grasshopper infestation in southwestern Manitoba was augmented by migration flights. In this area crops were cut early to lessen damage, but late crops suffered. An adult survey showed a heavy build-up of the infestation in southern and western margins of the Province, probably largely due to flights. Weather conditions were favorable to egg laying, and a heavy infestation is expected in 1939. In southeastern Saskatchewan there were general flights of grasshoppers, and the invasion and loss in the Regina area was serious. Grasshopper damage and premature cutting rather generally reduced the production of oats and barley, with severe but spotty losses in some districts. Late wheat crops over much of the southeastern and south-central area suffered heavily from the clipping of heads by flying grasshoppers. Oats also were severely attacked, even after being stocked. Present prospects indicate an extension of infestation into areas of Saskatchewan not previously infested this season, and a general increase in intensity in most instances. In southern Alberta there was some increase of grasshopper numbers, as compared with 1937, and slight losses occurred in late crops. Grasshoppers were causing concern in parts of the Nicola Valley, British Columbia. The entire Peace River country was also more or less infested.

The wheat stem sawfly caused damage to wheat in central and southern areas of Alberta. Rains in the latter part of August rendered most of the sawfly-cut grain a total loss by knocking it flat to the ground. Considerable loss also occurred in Saskatchewan, where the damage was heavier than in 1937, although still considerably below the average annual total of the years prior to 1934.

An outbreak of the European earwig was reported for the first time in Eastern Canada, at Ayton, Grey County, Ontario.

The outbreak of the armyworm which occurred during the summer involved, to some extent, every Province from Prince Edward Island to Saskatchewan. The outbreak was locally severe in the three Maritime Provinces, Ontario, and Manitoba. In Quebec several counties were involved in a widespread outbreak, which affected thousands of acres of crops. The infestations in Saskatchewan were scattered, localized, and of light-to-moderate intensity, but several were in open prairie from which no reports were received in previous years.

A major outbreak of second-year white grubs largely destroyed thousands of acres of semipasture, and garden and field crops, in Durham, Ontario, and York Counties, Ontario. Important injury to market-garden crops also occurred in the Niagara district. In addition, there was much damage to crops by these insects in southern Quebec.

Records of abundance of European corn borer moths and larval establishment at the Chatham laboratory, in southwestern Ontario, indicated a tremendous increase in infestation during the present season, and it was expected that the borers would be more abundant than at any time during the last 10 years.

Reports of damage to sweet and ensilage corn by the corn ear worm were received from southern New Brunswick, and locally from Quebec, Ontario, Manitoba, and Saskatchewan.

In Prince Edward and Northumberland Counties, to the north of Lake Ontario, severe outbreak of the tobacco worm developed on tomatoes. In some fields the plants were stripped and the fruit attacked.

The potato or tomato psyllid (Paratrioza cockerelli Sulc.) greatly increased during the summer and now occurs over a large part of Saskatchewan and Alberta.

A cockroach injuring roses in a Grimsby, Ontario, greenhouse has been determined as Pycnoscelus surinamensis L. These specimens appear to be the first found established in Canada.

The codling moth has been very destructive in many apple orchards in the former districts of Ontario, and has been more injurious than usual on pears.

The European red mite has been more abundant on and injurious to plums and apples in southern Ontario than for several years. Many apple orchards in the Okanagan Valley, British Columbia, suffered injury from this species.

Weather conditions in the Niagara district, Ontario, this season were very favorable for the grape leafhopper and injury was severe in many unsprayed and poorly sprayed vineyards.

Twig infestation by second-brood oriental fruit moth larvae in the Niagara Peninsula at the end of August was lower than last year, with an average infestation of 2.5 percent, as compared with 3.5 percent in 1937. In southwestern Ontario the infestation was still running high, averaging 17.1 percent, with individual orchards as high as 55 percent.

The tarnished plant bug has been the cause of serious damage to peaches and pears in some orchards in the southern Okanagan, British Columbia, the fruit being badly scarred and misshapen. In one orchard 56 percent of the crop of 5 acres of young peach trees was culled on account of this injury.

The woolly apple aphid is again scarce in the Okanagan Valley, British Columbia, owing to natural enemies, including the introduced parasite Aphelinus li Hald.

The known distribution of the European spruce sawfly has been greatly extended. It has been found in an elliptical area in southern Ontario, extending from Hamilton north to Muskoka and from Stratford east to Peterborough. Individual larvae have also been received from Gracefield in the Gatineau Valley, Quebec, and from Hawk Junction on the Algoma Central Railway. In general the infestation in the southern part of the Gaspé area, Quebec, and in the northern part of New Brunswick was less this year, owing, apparently, to the abnormally high percentage remaining in diapause. In southern New Brunswick there was a general increase. A noticeable increase in the number of dead trees was recorded in the Gaspé.

The dying of birch is becoming an important problem, particularly in southern New Brunswick. The dying trees generally have the appearance of having been attacked by the bronze birch borer, and all those examined showed evidence of the work of this insect.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

Illinois. W. P. Flint (September 23): Fall surveys to date show grasshoppers about normal or subnormal numbers in the State.

Missouri. L. Haseman (September 21): A survey of adult-grasshopper abundance been completed and, except for a few scattered areas, particularly in north central Missouri and a few counties through the central part of the State south of the Missouri River, records indicate that grasshoppers are back to normal and not seriously threatening. Preliminary check-ups on egg abundance indicate that conditions have been favorable for egg deposition, and in a few counties where the pest has been most abundant a fairly heavy crop of eggs is expected to be carried over the winter.

Arkansas. D. Isely (September): The red-legged grasshopper (Melanoplus femur-rubrum Deg.) has become the most numerous species during September.

Oklahoma. C. F. Stiles (September 22): Population greatly decreased over the eastern half of the State by poisoning and by natural enemies. In the Panhandle the migratory grasshopper (Dissosteira longipennis Thos.) is doing considerable damage. Flights of these grasshoppers have occurred since July 20 and they are now depositing eggs over a large part of the Panhandle. The species is generally distributed over the western quarter of the State. Some large egg beds already reported.

Texas. F. L. Thomas (September 22): Grasshoppers, D. carolina L. and M. differentialis Thos., abundant in Sudan grass in Hardeman County.

Arizona. L. O. Barnes (August 31): At Tempe, Maricopa County, the late nymphal instars and the adult stage of M. differentialis caused severe damage, up to 60 percent, in a few alfalfa fields during the growth of the third hay crop early in July. Populations of 35 per square yard observed. Much feeding and considerable damage to the foliage of the fourth alfalfa crop has continued in certain areas during August. In one quarter-section the average number of hoppers of this species increased from 3.46 per square yard found during the adult survey in 1937, to 9.9 per square yard in 1938. Migrations were not a factor in causing the change in population density. On August 25 two large alfalfa fields in the South Gila Valley, 6 miles east of Yuma, had mixed infestations of adults of M. mexicanus Sauss. and M. differentialis, the hopper populations being estimated at six and eight per square yard, respectively. In a 300-acre tract of alfalfa located 12 miles east of Yuma, Yuma County, a third general hatch of M. mexicanus was well underway on August 24-25. Populations of first- and second-instar nymphs ranged from 1 to 25 per square yard. No early instar nymphs were present on August 2. Rainfall for the 3-day period August 5-7 was 2.41 inches in a very small area that included this 300-acre alfalfa field,--1.76 inches falling within 1 hour on August 7. In 1936 and 1937 the third general hatch of M. mexicanus did not begin until September. In those years precipitation from July to October did not exceed 0.6 inch. These unusual and

excessively heavy rains early in August apparently altered soil conditions enough to stimulate hatching of M. mexicanus eggs, thereby advancing the date for the beginning of the fall hatch by 3 to 5 weeks. A total of 2,000 acres of cultivated, idle, and reverted lands was examined in search of grasshoppers at Chino Valley, Yavapai County, on August 15-17. M. lakinus Scudd. was the dominant species. Average nymphal populations were: 5 per square yard in alfalfa, 18 in Russian-thistle reversion, and 14 per square yard along weedy and grassy field edges. Maximum populations in alfalfa exceeded 30 per square yard and defoliation due to feeding reached 15 percent in such fields. Populations in excess of 100 per square yard recorded in some Russian-thistle areas and along some fence rows. Damage to pinto-bean foliage reached 10 percent when the beans were adjacent to large areas of Russian-thistle. Light hatching of M. lakinus began early in July, following light rains on June 28 and 29. Main hatching season started immediately following a heavy rain on July 26. Of 80 egg pods examined on July 29, 7.5 percent had hatched or were hatching. By August 15-17, 80 percent of the eggs had hatched and hoppers were present from the first nymphal instar to the adult stage, there being very few adults but many second- to fourth-instar nymphs.

Minnesota. A. G. Ruggles and assistants (September): Grasshoppers are still active, being reported from scattered localities throughout the State. Most of the reports are from the southern half of the State.

Montana. H. B. Mills (September 23): There is little evidence of the large grasshopper flight that invaded Montana in July. Large numbers flew on to the north, out of Montana, and those remaining have been dying off steadily until, on September 12-14, counts of two or three hoppers per square yard were the rule throughout large areas in northeastern Montana. Sarcophagids have been responsible for a large part of this reduction. Egg laying, however, was intense in many areas. Beeflies and blister beetles have in some localities destroyed at least 40 percent of the eggs.

Nevada. G. F. Knowlton (August 27): Eggs are still hatching in some fields examined at Garden City, Randolph, Woodruff, and Huntsville, northern Utah, some farms being largely infested by small nymphs. Egg laying has been going on for several weeks in most parts of the State. (September 20): Injury is still occurring in some northern localities. Egg laying is occurring generally, with early season species becoming scarce except where hatching was late.

Oregon. D. C. Mote (September): Camula pellucida Scudd. is on the egg beds. Deposition of eggs is heavy in certain areas of eastern Oregon. Melanoplus spp. are laying generally in margin lands and waste lands throughout the eastern part of the State.

California. Kern County Monthly News Letter (September 6): Grasshopper situation in Kern County about the same as last month, there being more injury from hoppers feeding on blooms of cotton plants than was first anticipated. A few acres of cotton south of Arvin seriously injured. No eggs found.

MORMON CRICKET (Anabrus simplex Hald.)

United States. C. Wakeland (September): Highlights in the year's control program, which is now at an end, are as follows: The almost complete crop protection in all areas where control was adequately planned; the severe defoliation and seed destruction by crickets of range grasses and browse plants; the almost complete eradication of crickets in Moffat County, Col.; the reduction in populations in several counties in other States, making it possible to attain eradication in 1939; the general reduction of populations, due to control work, in many of the older infested counties; and the material increase in the size of the infested areas in Oregon, North Dakota, South Dakota, and Nebraska.

SUGAR-BEET WIREWORM (Limonius californicus Mann.)

California. M. W. Stone (September 7): Responsible for considerable damage to young sweet corn plants in a 60-acre field near Downey, Los Angeles County.

JAPANESE BEETLE (Popillia japonica Newm.)

New England, New York, and New Jersey. C. H. Hadley (September): In general, an increase in abundance is indicated, as compared with 1937, particularly in Connecticut and at points in western Massachusetts. A heavy but localized infestation found near South Egremont, in the Berkshire area of Massachusetts, had evidently existed for a number of years, being of particular interest in that it occurs in a northern area of relatively high elevation. At points of infestation in New Hampshire and Maine slight-to-general increases in abundance this season were noted. In the New York City area there has been a fairly general increase in the infestation over that observed last year. In that section the general infestation appears to be spreading more rapidly into western Connecticut than in certain portions of its outer limits above New York City. In northern New Jersey only a moderate advance in the outer limits was noted at most points. Infestation throughout the greater part of New Jersey less severe than that of 1937. Heaviest infestation, as for the last several years, is centered in portions of Cumberland and Salem Counties, southeastern New Jersey.

ORIENTAL BEETLE (Anomala orientalis Wtrh.)

Connecticut and New Jersey. C. H. Hadley (September): Reports indicate some increase in populations of the oriental beetle in northern New Jersey and southwestern Connecticut, as compared with 1937.

ASIATIC GARDEN BEETLE (Autoris castanea Arrow)

Connecticut, New York, New Jersey, Pennsylvania, and District of Columbia. C. H. Hadley (September): Reports show a noticeable increase in the population in northern New Jersey, in the area including and surrounding metropolitan New York, and in southwestern Connecticut along Long Island Sound, as compared with last year. Also somewhat more abundant in the immediate vicinity of Riverton, N. J., in parts of Philadelphia, Pa., and in Washington, D. C.

FULLER'S ROSE BEETLE (Pantomorus godmani Crotch)

- North Carolina. D. L. Wray (August 29): Extensive damage noted in Wilmington, New Hanover County, on a block of boxwood in a nursery. Large areas, about one-eighth acre, almost completely defoliated by the adults. Large numbers could be collected by jarring the plants.
- Georgia. A. L. Brody (September 19): About 50 percent of the rose bushes and 75 percent of the leaves of coffee weed showed feeding signs at Valdosta, Lowndes County.
- Alabama. J. M. Robinson (August 31): Attacking azaleas at Headland, Henry County, on August 5. Also reported on tung-oil trees at Citronelle, Mobile County, on August 25.
- Mississippi. G. L. Bond (September 23): Specimens taken from verbena at Lucedale, George County, on August 22. Plants showed considerable feeding.
- Louisiana. C. O. Eddy (September): On tung-oil trees. (Det. by L. L. Buchanan.)

C E R E A L A N D F O R A G E C R O P I N S E C T S

WHEAT AND OTHER SMALL GRAINS

ARMYWORM (Cirphis unipuncta Haw.)

- Maine. J. H. Hawkins (September 24): Second brood of armyworm more abundant than usual on grass and corn in central Maine. As the brood is more widely scattered, the damage is not serious.
- Connecticut. E. P. Felt (September 23): Reported as causing some injury to lawns at Ridgefield, Fairfield County.
- Tennessee. L. B. Scott (September 19): Reported from several points in Montgomery County, north-central Tennessee, the damage being severe in the comparatively few fields attacked.
- Missouri. L. Haseman (September 21): Usual flight of moths which generally occurs ahead of frost in central Missouri not taking place this fall.
- Nebraska. M. H. Suenk (September 20): Reported on September 14 as having destroyed a field of about 30 acres of volunteer barley in Nuckolls County.

HESSIAN FLY (Phytophaga destructor Say)

- Illinois. W. P. Flint (August): Losses from hessian fly this year very light, although some fields suffered an early spring infestation, which necessitated plowing them up. Highest infestation shown by our survey is an average of 14 percent of all tillers in wheat stubble infested in Clark County. Other counties showing as high as 10 percent infestation are Edgar, Fulton, Kankakee, and McDonough. As a result of the survey, serious general damage is not expected this fall.

Missouri. L. Haseman (September 21): Situation throughout the State apparently rather favorable and no especial drive being made on delaying seeding, except in a few counties in southwestern Missouri, where there was a fair local carryover of flaxseeds in summer stubble.

WHEAT JOINTWORM (Harmolita tritici Fitch)

Illinois. W. P. Flint (August): Jointworm of no consequence in any section of the State, except in Randolph County and the adjoining section of southwestern Missouri. In most places less than 1 percent of the tillers is infested.

Missouri. L. Haseman (September 21): Recent stubble surveys throughout central Missouri indicate one of the heaviest infestations that has carried over stubble in years.

CORN

CORN EAR WORM (Heliothis obsoleta F.)

Connecticut. N. Turner (September 20): Very light infestations in sweet corn.

New York. L. A. Carruth (September 27): Less abundant than usual on western Long Island, although serious damage has occurred. During September injury to tomatoes observed for the first time in recent years on western Long Island. On September 17 approximately 15 percent of the ripening tomatoes in a field near Roslyn were infested.

North Carolina. J. F. Cooper (September 23): Severe damage to late corn noted near Spencer. Reports indicate this condition to be general in Rowan and Iredell Counties.

South Carolina. J. G. Watts (September 23): Twenty-five acres of late corn near Cope, Orangeburg County, completely destroyed. In most cases stalks are stripped inside and out. Considerable feeding on the outer surface and tips of okra pods at Blackville, Barnwell County. Little loss was caused by the insect but diseases were established in the seed pod because of it.

Mississippi. C. Lyle (September 23): Field of tomatoes in Madison County reported as showing at least 25 percent damage. A few reports of worms as completely ruining late corn were received from the Moss Point district, Jackson County. Reported as abundant in late corn in northwestern Mississippi and as ruining fields of late corn in Webster, Choctaw, and Winst Counties.

E. W. Dunnam and J. C. Clark (September 24): Causing serious damage to late-planted corn in Washington County.

Ohio. T. H. Parks (September 23): A few migrant moths noticed at street lights and taken in an insect-electrocutor trap early in September. Very little injury to corn or tomatoes throughout the season.

Missouri. L. Haseman (September 21): Late sweet corn and, in places, tomatoes show a heavy infestation, even where earlier summer generations were light.

Utah. G. F. Knowlton (September 14): Injury to sweet corn has increased during recent weeks in Cache, Box Elder, and Salt Lake Counties, although still below the level of the preceding 2 years. Counts in tomato fields at Lewiston, Cache County, showed injury to be light, seldom exceeding 1 percent.

FALL ARMYWORM (Laphygma frugiperda S. & A.)

Maine. J. H. Hawkins (September 24): Considerable loss to farmers and anxiety to canners in central Maine because of injury to corn ears.

J. V. Schaffner, Jr. (September 12): Heavy infestations reported in Knox County. Serious damage caused to sweet corn in the vicinity of Union.

Connecticut. N. Turner (September 20): Many ears ruined on late sweet corn at Mount Carmel Farm, southern Connecticut.

New York. L. A. Carruth (September 27): More abundant than usual on western Long Island. Serious foliage injury to young corn plants generally observed during August. Injury to sweet corn ears increasingly serious as the season progressed, the injury in most cases being similar to that caused by the corn ear worm, although the fall armyworm tended to do more damage to the husks and to the lower parts of the ears. One hundred ears approaching maturity were examined on September 24 and showed infestation of 92 percent, either of corn ear worms or fall armyworms. Out of the total of 164 worms found, 33 were corn ear worms and 131 fall armyworms. Larvae of all stages are present in considerable numbers. Egg masses and moths more common in cornfields than ever before observed by the writer.

North Carolina and South Carolina. W. A. Shands (September 1): Very severe injury caused to late corn over the area between Oxford, northern North Carolina through the State to Florence, S. C. General distribution all over the fields. (Det. by C. Heinrich.)

Georgia. T. L. Bissell (September 2): About an acre of gladiolus ruined at Hapeville, Fulton County, by feeding on flowers, flower stalks, and leaves. Beginning to feed in dahlia blooms on the same property. Infestation may have started in grass on the terraces, yet the gladioli have been fed on much more heavily than the grass. (September 8): Found on cotton and pepper at Experiment and Zebulon, central Georgia. (September 22): Newly hatched larvae on collard just sent in from Clarkston, DeKalb County. Moths laying eggs on screens and other places around homes at Experiment. On September 18 a large colony was found in a clothes closet, presumably from eggs brought in on a badminton net.

Mississippi. C. Lyle (September 23): Rather heavy damage to lawn grasses within Jackson City limits, Hinds County, reported on September 3. Heavy damage to late corn reported recently in Aberdeen, Monroe County, and Poplarville, Pearl River County.

Louisiana. C. O. Eddy (September): Abundant in fall corn.

Missouri. L. Haseman (September): Numerous complaints throughout the State since September 1 of injury by the fall armyworm in the tips of late field and sweet corn. Infestation at Columbia began late in August, the larvae developing rapidly, and pupation and emergence occurring since the middle of the month. Larvae still working in the tips of corn. Never before seen so abundant and so injurious in the tips of late corn.

Kansas. W. T. Emery (September 21): Larvae common in the immature field corn in the vicinity of Manhattan, Riley County.

Texas. F. L. Thomas (September 22): Injuring corn and hegari in Dickens, Hardeman, and Wichita Counties.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Maine. J. H. Hawkins (September 24): Increase in European corn borer in the canning areas of the State, in Waldo and Penobscot Counties, is alarming, except in the Fryeburg area, Oxford County, where it is reported as being under control.

Connecticut. N. Turner (September 20): Late corn very heavily infested in many parts of the State. Untreated corn in East Hartford, Milford, and Westport showed 100-percent ear infestation, and from 1 to 10 borers in each ear. At Mount Carmel there were 18 borers per plant and 3 borers per ear in late sweet corn (average for 100 plants taken at random). Less than 5 percent of the ears borer-free. Seed corn in Milford damaged 25 percent of the yield on 20 acres of hybrid seed. Various other crops seriously affected, a planting of raspberries in Newington, Hartford County, showing a heavy infestation in canes. Dahlias, hollyhocks, and asters seriously damaged. Tomato vines and fruit attacked in one garden.

New York. L. A. Carruth (September 27): On Long Island 90 to 100 percent of sweet corn plants are infested with second-brood borers, at the rate of about 600 larvae per 100 infested plants. Serious injury to dahlias observed. Early in September some plantings were from 30 to 50 percent infested. Infestations particularly serious because of the loss of bloom. In Columbia County (Hudson Valley) about 75 percent of stalks in a large cornfield were infested at the rate of about 750 larvae per 100 infested plants. Fields in Albany County were from 50 to 100 percent infested, with from 300 to 1,250 larvae per 100 infested stalks.

Ohio. T. H. Parks (September 23): While damage to corn is present in several counties of northwestern Ohio, yield losses will not be great and will be limited principally to the earliest planted corn. One field in Wood County observed on September 16 to have 22 percent of the stalks broken at or below the ear, owing to borer injury.

Indiana. J. J. Davis (September 27): With the center of infestation in Allen and Adams Counties, eastern Indiana, observations continue to emphasize the great increase of corn borer during the last year. In one field examined last week in Adams County every stalk was infested, with an average of 4 borers per stalk.

CHINCH BUGS (Blissus leucopterus Say)

Iowa. C. J. Drake (September 15): Weather conditions very favorable for the second generation of chinch bugs in southern Iowa, particularly in the southwestern part of the State, and many farmers report slight commercial damage. In a few instances entire fields have been badly injured.

Missouri. L. Haseman (September 21): Recent reports indicate the chinch bug as going into the winter in goodly numbers in a few counties in the north-central part of the State, as well as in a few of the counties south of the Missouri River. However, there are no indications of any serious general carry-over of bugs throughout the State.

Oklahoma. R. G. Dahms (September 20): Third-generation nymphs are abundant on late-planted sorghums in southwestern Oklahoma.

CORN LEAF APHID (Aphis maidis Fitch)

Wisconsin. C. L. Fluke (September 21): A severe outbreak, the heaviest noted in the last 22 years, occurred in all parts of the State where corn is grown. Definite reports chiefly from the southern and western counties.

Minnesota. A. G. Rugales and C. E. Mickel (September 13): Reported on corn, and as causing a lot of worry to farmers, especially in the southern half of the State.

Nebraska. M. H. Swenk (September 20): Reported from Cass County on September 19 as injuring the tassels of corn.

Oklahoma. R. G. Dahms (September 20): Present on sorghums throughout southwestern Oklahoma.

CORN LANTERN FLY (Peregrinus maidis Ashm.)

Alabama. J. M. Robinson (August 31): Found on corn at Atmore, Escambia County, on August 24.

BUMBLE FLOWER BEETLES (Euphoria spp.)

North Carolina. C. S. Brimley (September 14): E. sepulchralis F. reported as eating out bud and tassel of corn on farm at Wake Forest, Wake County. Damage severe.

Alabama. J. M. Robinson (August 31): Bumble flower beetle (E. inda L.) reported in cotton boll at Fort Payne, De Kalb County, on August 20.

Wisconsin. C. L. Fluke (September 21): Adults (E. inda) extremely numerous in Richland and Marathon Counties, feeding on ears of field corn in the milk.

ALFALFA AND CLOVER

BEET WEBWORM (Loxostege sticticalis L.)

Arizona. O. L. Barnes (August 31): Adults and larvae present in all alfalfa fields examined in the Roll district, Yuma County, southwestern Arizona, on August 26. Damage caused by larval feeding slight, however, and adults did not appear to be thickly concentrated at any location visited. Quite numerous in several alfalfa fields at Chino Valley, Yavapai County, southwest of central Arizona, on August 19. (Det. by C. Heinrich.)

Utah. G. F. Knowlton (September 12): Ten acres of young alfalfa completely destroyed at Circleville, Piute County, south-central Utah. (September 12). Still active in beet and alfalfa fields, and on Russian-thistle in northern Utah.

ALFALFA CATERPILLAR (Eurytus eurytheme Bdv.)

California. A. E. Michelbacher (September 22): Serious damage in parts of the San Joaquin Valley, central California, by larvae of the alfalfa butterfly. In some fields disease and parasites apparently reduced the population of larvae to a point where they were unable to cause any economic damage.

ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (September 22): Larvae present during most of the summer in several fields in the San Joaquin Valley. As late as September 13 in 1 field an average of 17 larvae were collected to 100 sweeps and an insect net.

A LEAF BEETLE (Colaspis viridiceps Schaeff.)

Arizona. O. L. Barnes (August 31): At Roll, Yuma County, adults were feeding on the foliage of young alfalfa on August 26. One field, where the crop was in the prebloom stage, showed foliage injury estimated at 10 percent. Where the plants were more advanced in development, the damage was less.

PEA APHID (Illinoia pisi Kltb.)

Maine. J. H. Hawkins (September 24): Present in clover planted with late cannery peas in Exeter, Penobscot County. Clover in early and mid-season cannery peas on the same farm not heavily infested.

Utah. G. F. Knowlton (September 14): Abundant on succulent alfalfa at Wellsville and Hyde Park, Cache County, and Nibley, Sevier County.

A TRYPETID (Stenopa vulnerata Loew)

North Carolina. G. B. Merrill (August): Very numerous this year, as last, in the Valle Crucis area, Watauga County, at an elevation around 3,000 feet. Swarms from red clover fields, or fields in which red clover was scattered.

SOYBEAN

GREEN CLOVER WORM (Plathypena scabra F.)

Indiana. J. J. Davis (September 3): Larvae received from Campbellsburg, Washington County. Had infested an acreage of soybeans and suddenly died of a fungus disease, owing, no doubt, to excessive rains. The fungus was determined by V. K. Charles as Spicaria rileyi.

COWPEAS

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Texas. J. N. Roney (September 22): Infestation on cowpeas in Galveston County.

COREIDS (Alydus spp.)

Georgia. T. L. Bissell (August 29): Adults of A. eurinus Say and A. pilosulus H. S. rather common on cowpea pods at Experiment, central Georgia.

VETCH

VETCH BRUCHID (Bruchus brachialis Fahr.)

Oregon. L. P. Rockwood (September 6): On August 27 a commercial seed analyst discovered live specimens of a bruchid in three samples of hairy vetch seed. Upon tracing the infested seed to its source, it was found to have originated on three separate farms located in northern Clackamas County, which contains no vetch acreage of commercial importance and for that reason had not been under the close surveillance exercised recently over the important vetch-seed-producing counties of the State. A hasty survey of seed-cleaning mills resulted in the further discovery of five additional lots of infested seed from Clackamas County and one from Marion County, respectively. (Det. by H. S. Barber.)

Washington. M. Reeher (September 20): More recent inspections have resulted in the finding of adults on windows and sacks of vetch seed in seed cleaning mills at Vancouver, Clark County, and Woodland, Cowlitz County, Wash. It was not possible to determine from what farms the seed came, but there is no doubt that it originated in either Clark or Cowlitz County, or in both. The present known distribution, therefore, apparently extends about 25 miles north and south of Portland, Oreg.

SORGHUM

-- SORGHUM WEBWORM (Celama sorghiella Riley)

Arkansas. D. Isely (September 22): There has been an outbreak in the northern counties of Arkansas, resulting in a loss of 25 to 50 percent in the weight of heads in many fields.

Texas. R. K. Fletcher (September 22): Reported as causing injury to hogari in Gonzales County.

GRASS

A LOOPER (Mocis repanda F.)

Texas. S. E. Jones (September 22): Destructive to grain crops, Sudan grass, Johnson grass, and other grasses in Zavala, Dimmit, and La Salle Counties.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis F.)

Louisiana. B. A. Osterberger (September): Infestation as a whole very light, with a few heavily infested areas. Cane borer egg parasite, Trichogramma very active, with better than 86-percent parasitization of all eggs collected.

F R U I T I N S E C T S

LESSER APPLE WORM (Grapholitha prunivora Walsh)

Maine. F. H. Lathrop (September 23): There is a distinct increase in infestation of apples in the south-central and western parts of the State, as compared with that in the last few years. Infested plums received from Waterville, Kennebec County.

YELLOW-NECKED CATERPILLAR (Datana ministra Drury)

Connecticut. E. P. Felt (September 23): Reported as abundant and somewhat injurious on apple trees at Old Lyme, New London County.

Virginia. A. M. Woodside (September 22): Some young apple trees in the vicinity of Waynesboro, Augusta County, defoliated.

Minnesota. A. G. Ruggles and C. E. Mickel (September 13): Reported from the south-central part of the State.

RED-HUMPED CATERPILLAR (Schizura concinna S. & A.)

Connecticut. E. P. Felt (September 23): Reported as somewhat abundant in a number of localities in southern Connecticut, feeding mostly on small apple trees.

HOWARD'S SCALE (Aspidiotus howardi Ckll.)

Texas. O. G. Babcock (September 15): Severe on scattered plum and peach trees in Sonora, Sutton County. Some trees killed.

SAN JOSE SCALE (Aspidiotus perniciosus Const.)

Georgia. O. I. Snapp (September 19): The San Jose scale on peach trees increased rapidly during August and September in central Georgia. The infestation in a few orchards has reached a stage of encrustation; however, the general infestation in central Georgia is not greater than that of an average year.

Missouri. L. Haseman (September 21): Throughout the State as a whole this scale apparently is not serious, although it is threatening in some orchards.

MITES (Tetranychus spp.)

Washington, E. J. Newcomer (July): The Pacific mite (T. pacificus McG.) is attacking apple in Yakima and Wenatchee Valleys. Very common throughout central Washington and probably as abundant as usual. (Det. by E. A. McGregor.)

Oregon. E. J. Newcomer (July): Specimens of the Willamette mite (T. willamettei McG.) collected for identification from Medford and Talent, Jackson County, on July 7, 13, and 14. (Det. by E. A. McGregor.) (July 18): Reported as rather abundant at Hood River, Hood River County, on apple and pear.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Virginia. A. M. Woodside (September 22): Infestation increased rapidly during August. Total infestation in Augusta County probably heavier than for any season since 1933.

Ohio. T. H. Parks (September 23): Peak of second-brood bait-pan catch at Columbus on August 8. Many new entrances noticed by growers, beginning the middle of the month. Apple crop now being harvested not suffering seriously, except in orchards where the insect has been a serious problem for several years. Control in Lawrence County, southern Ohio, much better than last year, most severely infested orchard having 34 percent of the fruit blemished with stings, while the lightest crop infestation was 6 percent.

Tennessee. G. M. Bentley (September 26): Apples from uncared-for orchards in isolated mountain districts show infestations of the second brood.

Missouri. L. Haseman (September 21): In unsprayed orchards a heavy carry-over of larvae expected this winter. August and early September generation of larvae a little late in maturing. Peak of moth emergence in central and northern Missouri occurred during the last few days of August and the first week in September. Normally this peak occurs around August 15 to 20 in central and northern Missouri. In southern Missouri the peak of moth emergence occurred a week earlier.

Kansas and Missouri. H. Baker (September 26): Third-brood larvae caused considerable damage during the first half of September. Bait-trap catches of moths held to a high level until September 13, since which time smaller catches have been and are still being taken. Reported from northeastern Kansas and northwestern Missouri.

Washington. E. J. Newcomer (September 15): Reported from Yakima on apples and pears. Hot weather during the last week has resulted in renewed activity of the codling moth.

Oregon. D. C. Mote (September): At peak of second generation about August 15. Very abundant during season.

FRUIT TREE LEAF ROLLER (Cacoecia argyrospila Walk.)

Missouri. L. Haseman (September 21): From the unusually heavy infestation late spring throughout the State, a heavy carry-over of egg packets may be expected this winter.

OBLIQUE-BANDED LEAF ROLLER (Cacoecia rosaceana Harr.)

Washington. E. J. Newcomer (September 12): This species has been reared from larvae sent from Hanford, Benton County. Reported as very abundant on apple.

APPLE LEAF SKELETONIZER (Psorosina hammondi Riley)

Missouri. L. Haseman (September 21): During the month complaints of severe foliage injury received from the various orchard centers of the State, but it seems particularly injurious in central and northern Missouri. Favorable conditions provided for this pest in young and unsprayed orchards.

Nebraska. M. H. Swenk (September 20): Hawthorn tree in Burt County reported on September 14 as being attacked.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Missouri. L. Haseman (September 21): Recent check-ups in orchards in central Missouri reveal that there is a very light carry-over of borers.

Nebraska. M. H. Swenk (September 20): Complaints of damage continued to be received from August 21 to September 20, coming chiefly from Lincoln and Morrill Counties.

ROUNDHEADED APPLE TREE BORER (Saperda candida F.)

Missouri. L. Haseman (September 21): A moderately heavy infestation in some orchards in the vicinity of Columbia. Most of the borers now average $\frac{1}{2}$ inch to $\frac{3}{4}$ inch in length, and are preparing for the winter.

APPLE CURCULIO (Tachypterellus quadrigibbus Say)

Wisconsin. C. L. Fluke (September 21): Increase of fall adults and fall injury quite common in Richland and Crawford Counties.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

Maine. F. H. Lothrop (September 23): There has been a distinct increase in the amount of injury to apples in south-central and western Maine this year, as compared with 1936 and 1937. The injury to blueberries in eastern Maine is so increased this year, as compared with the last few years.

Michigan. R. Hutson (September 27): Infestations observed at Grand Rapids, East Lansing, Saginaw, Owosso, and Battle Creek.

WHITE APPLE LEAFHOPPER (Typhlocyba pomaria McAtee)

Maine. F. H. Lathrop (September 14): The infestation has increased on apples near Monmouth, south-central Maine, as compared with the last 3 years. The leafhoppers are now almost entirely in the adult stage, although a very few last-stage nymphs are present. No evidence of deposition of winter eggs yet.

Connecticut. P. Garman (September 22): Reported from New Haven County. In general, less abundant than usual. A few growers reported threatening infestations in August.

Virginia. A. M. Woodside (September 22): Abundant in some orchards in Augusta County.

PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (September 22): Average infestation throughout the State about twice that of last year. Parasitization in general very low. Some secondaries showing in collections from various orchards.

Georgia. O. I. Snapp (September 19): Infestation in peach nursery stock at Fort Valley, central Georgia, not so heavy as usual.

T. L. Bissell (September 20): The shoots of a shrub, Photinia serrulata, heavily infested by caterpillars that resemble those of the oriental fruit moth. The larvae tunnel the ends of the shoots and also mine the bark. Almost every shoot has one or more larvae. They do not desert infested shoots, as in peach. Infestation observed at Experiment, September 14-20.

Mississippi. E. W. Dunnam and J. C. Clark (September 27): This insect has caused serious damage to the twigs of peaches, both commercial and ornamental, and the larvae are yet damaging photinia shrubs.

Ohio. T. H. Parks (September 23): Damage in Ottawa County to peaches much less than a year ago. No serious losses incurred.

Mississippi. C. Lyle (September 23): Reported as having done moderate damage to peach trees during the last month in the Brookhaven and Jackson districts, Lincoln and Hinds Counties, respectively. Specimens accompanied by complaints of damage received from Alcorn, Forrest, Monroe, Copiah, and Chicawasha Counties.

PEACH BORER (Conopia exitiosa Say)

Georgia. O. I. Snapp (September 19): Second-generation pupae taken from 1- and 8-year-old peach trees in orchards at Fort Valley. However, the number was an insignificant fraction of the total population. The peak of pupation and moth emergence occurred a little later than usual. The infestation was moderate, or about that of an average year.

Oklahoma. F. A. Fenton (September 20): Reported at Owasso, Tulsa County.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Maine. F. H. Lathrop (September 23): There is a distinct increase in the amount of injury to apples in south-central and western Maine, as compared with the last 4 or 5 years.

Michigan. R. Hutson (September 27): Infestations evident on apples practically all over the State. Injury in the form of feeding punctures especially noticeable.

Georgia. O. I. Snapp (September 19): Most of the adults have left peach orchards at Fort Valley for places of hibernation.

TARNISHED PLANT BUG (Lygus pratensis L.)

Ohio. T. H. Parks (September 23): Injury to green peaches severe in an orchard in Fairfield County, southeastern Ohio.

CHERRY

CHERRY MAGGOT (Rhagoletis cingulata Loew)

Oregon. D. C. Mote (September): Found in normal abundance in the Willamette Valley and in Union County, northeastern Oregon. Damage only serious where trees were not sprayed.

PEAR SLUG (Eriocampoides limacina Retz.)

Utah. G. F. Knowlton (September 8): Seriously damaging the foliage of ornamental hawthorn at Smithfield, Cache County.

Washington. B. J. Landis (September 20): Somewhat abundant on some cherry trees in Puyallup, Pierce County.

A BEETLE (Syneta albida Lec.)

Oregon. D. C. Mote (September): Heavy on cherries in the Willamette Valley, doing serious damage.

GRAPE

GRAPE LEAF FOLDER (Desmia funeralis Hbn.)

Texas. F. L. Thomas (September 22): Reported on grapes in Comanche County.

California. E. O. Essig (September 10): Defoliating vineyards in great abundance in certain areas of the San Joaquin Valley and doing considerable damage.

EIGHT-SPOTTED FORESTER (Alypia octomaculata F.)

Texas. O. G. Babcock (September 15): Severe on native and cultivated grapes in the vicinity of Sonora during the first 3 weeks in August.

GRAPE SAWFLY (Erythraspides pyamaea Say)

Virginia. C. R. Willey (September 2): Larvae and adults of a sawfly collected at Glade Spring, Washington County, where they had defoliated several large grapevines. (Larvae det. by R. A. Cushman; adults det. by G. A. Sandhouse.)

GRAPE PHYLLOXERA (Phylloxera vitifoliae Fitch)

New York. E. P. Felt (September 23): Galls in some abundance reported from near Farmingdale, Long Island.

RASPBERRY

RASPBERRY CANE BORER (Oberea bimaculata Oliv.)

Minnesota. A. G. Rugales and C. E. Mickel (September 13): Reported as damaging raspberry all over the southern part of the State.

RASPBERRY ROOT BORER (Bembecia marginata Harr.)

Washington. W. W. Baker (September 20): Adults began to emerge during the first 2 weeks of August and most of them had emerged by the last week of August. First eggs were found on August 9. Eggs parasitized by Telenomus sp. observed first on August 24. In collections of eggs made on September 16 the parasitization ranged from 6.7 to 41.4 percent.

PECAN

CASEBEARERS (Acrobasis spp.)

Florida. S. O. Hill (September 24): Owing to the unseasonably dry weather in the Monticello district, Jefferson County, and the consequent drying up of the leaves, the nut casebearer (A. caryae Grote) and the pecan leaf casebearer (A. juglandis LeB.) went into hibernation early. A few hibernacula observed late in July, and a considerable number went into hibernation during August and the first part of September.

PECAN CIGAR CASEBEARER (Coleophora caryaefoliella Clem)

Texas. R. K. Fletcher (September 22): Sent in from Webb County.

PECAN APHIDS (Aphidae)

Mississippi. C. Lyle (September 23): Specimens of Longistigma caryae Harr. sent in on August 30 from Itta Bena, Leflore County, with the report that they were very abundant on pecan trees. Pecan leaves showing injury by Melan. callus caryaefoliae Davis received from Laurel, Jones County, on September 10.

CITRUS

WHITEFLIES (Dialeurodes spp.)

Georgia. S. B. Fenne (September 20): Injury to Satsuma oranges and Camellia japonica continues to be severe.

Florida. J. R. Watson (September 24): Maximum emergence of D. citri Ashm. in Alachua County about September 10. Brood apparently heavier than in other years.

Mississippi. C. Lyle (September 23): Whiteflies (D. citri) reported as very abundant on ornamentals in southwestern Mississippi. Also annoying in homes and stores, especially late in the evening, when millions are in the air. Reported as very abundant in Poplarville during September and as moderately abundant on Cape-jasmine in central Mississippi.

Louisiana. C. O. Eddy (September): There has been a large flight of whiteflies during the last 2 weeks.

PURPLE SCALE (Lepidosaphes beckii Newm.)

Florida. M. R. Osburn (September 19): Heavy infestations noted on oranges and grapefruit in central Florida.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (September 24): Owing to the unseasonably dry weather in August, rust mites were abundant in a large part of the Citrus Belt, particularly in the central counties.

M. R. Osburn (September 13): Infestations are on the increase again, after the natural summer slump.

FIG

RED-SHOULDERED PLANT BUG (Thyanta custator F.)

California. G. H. Kalcostian (August 15): Found feeding on fallen dried figs of a grower in Fresno County. The figs being fed on had previously been injured by darkling beetles and by rabbits or squirrels.

MEALYBUGS (Coccidae)

Mississippi. G. L. Bond (September 23): Fig trees in Pascagoula, Jackson County, heavily infested with mealybugs.

COCONUT

DESTRUCTOR SCALE (Aspidiotus destructor Sign.)

Florida. M. R. Osburn (September 17): Numerous on coconut palms at Miami and Hollywood, southern Florida.

TRUCK CROP INSECTS

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

- Ohio. N. F. Howard (September 21): Striped cucumber beetle still numerous in the vicinity of Columbus.
- Missouri. L. Haseman (September 21): Very numerous on late cucurbits. Now confining their feeding largely to late blossoms. Numbers indicate a heavy carry-over.
- Louisiana. C. O. Eddy (September): Cucumber roots being attacked by the larvae of a species of Diabrotica.
- Texas. J. N. Roney (September 22): On cantaloups and cucumbers in Galveston County.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

- South Carolina. J. G. Watts (September): Present in a 10-acre field of summer crockneck squash at Ridgeland, but not abundant early this month. At Blackville they were abundant early in the month on cucumbers but have been decreasing in numbers since that time. They were never abundant on fall cantaloups. This has been the most abundant species of Diabrotica in this section since early spring until this month, when it has been far outnumbered by D. balteata Lec. Still getting several hundred at trap light every night.
- Mississippi. C. Lyle (September 23): Injury to corn silks and gourds reported recently from Crystal Springs, Covich County.
- Illinois. W. P. Flint (September 23): One report received of serious damage by the southern corn rootworm to early planted field rye. The larvae had destroyed large areas of rye over the entire field. The rye was planted following soybeans.
- Missouri. L. Haseman (September 21): Now confining their feeding largely to late cucurbit blossoms, their numbers indicating a heavy carry-over.
- Texas. J. N. Roney (September 22): Reported on tomato and eggplant in Galveston County.

BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

- South Carolina. J. G. Watts (September): At Ridgeland during the early part of the month this insect was extremely abundant and doing serious damage to squash. At Blackville the population steadily built up on cucumbers and cantaloups through the early and middle parts of the month, but during the last 10 days there has been little change. Considerable injury was done to cucumbers but cantaloups did not suffer. Most abundant of three species of Diabrotica on cucurbits.
- Mississippi. C. Lyle (September 23): Injury to corn silks and gourds reported recently from Crystal Springs, Covich County.

Louisiana. P. K. Harrison (September 17): Adults doing considerable injury to cucumber foliage and blossoms at Baton Rouge.

Texas. J. N. Roney (September 22): Reported on cowpeas, eggplant, pepper, mustard, and cabbage in Galveston County.

WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

California. E. O. Essig (August 30): Serious injury to fruits of apricots and peaches in and around Brentwood and vicinity. Apparently a distinct migration from the warmer parts of the valleys toward cooler areas. Also attacking truck and field crops and flowers in the lower Sacramento and San Joaquin Valleys, and the San Francisco Bay region.

WESTERN STRIPED CUCUMBER BEETLE (Diabrotica trivittata Mann.)

California. M. W. Stone and A. F. Howland (September 9): Over 45 percent of the plants in a 5-acre field of squash near Costa Mesa, southern California, were either dead or dying, as a result of attack by this pest. As many as 12 larvae found feeding on the roots of a single plant. Adults also numerous.

A BEETLE (Lema sexpunctata Oliv.)

Alabama. J. M. Robinson (August 31): Taken at Auburn on August 18, feeding on wandering-jew. Also feeding on vegetables at Auburn.

GREEN STINKBUG (Acrosternum hilaris Say)

Virginia. C. R. Willey and F. R. Freund (September 22): Brought in from Blackstone. Reported as damaging lima beans in that section on August 26.

South Carolina. J. G. Watts (September 21): On September 10 at Ridgeland this insect was present on squash, but no evident damage was resulting. At Blackville on September 21 nymphs and adults were present on cotton in small numbers.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Mississippi. C. Lyle (September 23): Severe damage to lima beans reported recently from Braxton, Simpson County.

FALSE CHINCH BUG (Nysius ericae Schill.)

North Carolina. C. S. Brimley (September 14): Sucking the leaves of turnips at Wake Forest, where considerable damage has been done.

A SCUTELLERID (Chelysoma guttatum H. S.)

Georgia. T. L. Bissell (August 29): A number of adults found on croton at Experiment. I had collected only one individual before these.

A STINKBUG (Cosmopepla bimaculata Thos.)

North Carolina. G. B. Merrill (August): Very numerous, especially on mullein, in the Valle Crucis area, Watauga County. Elevation around 3,000 feet.

HORNWORMS (Protoparce spp.)

Georgia. T. L. Bissell (September 3): A few tomato hornworms on piniento pepper at Experiment, central Georgia. They eat leaves and fruit, feeding largely on the stems and the basal part of the fruit.

Texas. O. G. Babcock (September 15): Very numerous on and doing damage to morning-glories in western Texas.

California. A. E. Michelbacher (September 22): In the Brentwood area during the last week there has been a light build-up of hornworm larvae on tomato, damage done only in isolated spots.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

Virginia. H. G. Walker (August 29): Larvae found at Norfolk attacking strawberry plants near the surface of the ground. They were cutting off the leaves and causing the plants to die. (Det. by C. Heinrich.)

Alabama. J. M. Robinson (August 31): Reported on beans at Fort Payne.

GREENHOUSE WHITEFLY (Trialeurodes vaporariorum Westw.)

Michigan. R. Hutson (September 27): This whitefly destroyed about 3 acres of cucumbers in a field near Grand Rapids, Kent County, during the first part of September.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Missessee. G. M. Bentley (September 24): Remarkably little injury caused by this insect throughout the State.

Mississippi. J. Milton (September 23): Reported as attacking the fall crop of potatoes in the Jackson district, but no serious damage observed.

Oklahoma. R. G. Dahms (September 20): Reported as doing damage to eggplant in Comanche County.

FALSE POTATO BEETLE (Leptinotarsa juncta Germ.)

North Carolina. G. B. Merrill (August): Fairly numerous on solanaceous plants in the Valle Crucis area, Watauga County. Elevation around 3,000 feet.

WHEAT WIREWORM (Agriotes lineatus Say)

Maine. J. H. Hawkins (September 24): Wet weather has caused the infestation in central Maine of ripe and green tomato fruit where the tomatoes are in contact with the soil. The main crop of potato is showing some injury where digging is being done.

POTATO TUBER MOTH (Gnorimoschena operculella Zell.)

North Carolina. Z. P. Metcalf (September 30): Found doing serious damage to Irish potatoes in Gaston County.

Tennessee. G. M. Bentley (September 26): Reported in Lawrence County in very limited numbers. (No host plant given.)

Louisiana. C. O. Eddy (September 1): Potato and moth which emerged from the potato collected at Saint Benedict on August 28. (Det. by A. Busck.)

California. A. E. Michelbacher (September 22): In the San Jose region there is a light infestation on tomatoes.

J. Wilcox (September 15): In the later pickings of one field at Huntington Beach, from 15 to 20 percent of the tomatoes are infested. Infestation apparently started from stored potatoes.

TOMATO PINWORM (Gnorimoschena lycopersicella Busck)

California. A. E. Michelbacher (September 22): In the San Jose region only a single larva has been taken on tomatoes.

CORN EAR WORM (Heliothis obsoleta F.)

Virginia. H. G. Walker and L. D. Anderson (September 27): A field of snap beans in the Western Branch section of Norfolk County was very seriously injured with what appeared to be the corn ear worm.

California. J. Wilcox and M. W. Stone (September 19): The first three pickings in a 20-acre field at Garden Grove, southern California, of medium-to-late tomatoes in the plots dusted with cube (checks) averaged 35-percent infestation, this being heavier than that in any of the early fields.

A. E. Michelbacher (September 22): Infestation not serious in the northern tomato-producing section of the State. On September 8 a survey made in the southern end of the Santa Clara Valley showed infestation ranging from 0 to 2 percent. In fields around San Francisco Bay infestation was late in starting. At San Jose, where tomatoes are usually seriously attacked, it was not necessary to dust until September 1. Infestation at Pleasanton is light, averaging about 1.5 percent in undusted fields. Infestation slowly building up in the Brentwood area. Survey made on September 21 showed infestation ranging from 2 to 3 percent in undusted fields.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Massachusetts, Connecticut, and New York. A. M. Vance (September): Very definite increases in infestation in potatoes in 1938 over 1937 in central Connecticut and west-central Massachusetts, and a significant decrease on eastern Long Island, N. Y. In Connecticut 8 of the fields examined, or 44.4 percent, had populations averaging over 400 borers per 100 plants, and in Massachusetts 5 of the fields, or 27.8 percent, showed infestations of this intensity. Maximum populations in individual fields of potatoes in 1938 averaged 870 and 860 borers per 100 plants in Connecticut and Massachusetts, respectively, with as many as 17 borers being found in a single plant.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Tennessee. G. M. Bentley (September 24): Damaging where growers are not properly equipped to spray.

A MAGGOT (Hemerobia illucens L.)

Georgia. T. L. Bissell (September 15): Found destroying potatoes placed in a storage loft early in July. Of 25 bushels only 4 bushels remained unharmed. Three bushels of scraps and worms, mostly worms, were gathered. Owner said he has stored potatoes for 15 years in the same place without previous trouble. This time he neglected to dust with lime as had been his practice.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Connecticut. N. Turner (September): Second generation caused serious damage to untreated beans.

New York. N. Y. State Coll. Agr. News Letter (September 8): Early maturity of field beans has precluded expected severe defoliation by the second-generation larvae in counties having heavy infestations. Apparently, however, a high percentage of the second-brood larvae will be able to mature into beetles and the population going into winter quarters will be unusually large.

North Carolina. G. B. Merrill (August): Doing severe damage to beans in the Valle Crucis area, Watauga County. More prevalent than during a similar period last year.

Georgia. T. L. Bissell (September 8): Rather numerous on cowpeas and soybeans at Experiment. Most beetles are recently emerged. Few larvae were seen.

S. B. Fenne (September 21): Found in the northern half of the State for years; however, they seem to be adapting themselves to the hotter, southern part of the State. Severe damage reported from Decatur County.

A. L. Brody (September 19): Fifty percent of the foliage of cowpeas and beggarweeds skeletonized in Valdosta, Lowndes County.

Florida. A. H. Madden (September 20): Abundant in the vicinity of Havana, Gadsden County, and causing severe damage to the fall planting of string beans.

Alabama. J. M. Robinson (August 31): Continues to be abundant at Auburn.

Mississippi. C. Lyle (September 23): Reported for the first time during August in Hinds, Lafayette, and Panola Counties, these points being the western limits of its spread in Mississippi. Heavy damage to snap beans and lima beans reported. Considerable injury to beans observed at Forest, Scott County, during the last month, while the insect is reported as continuing to destroy most of the untreated beans in the Aberdeen territory.

Tennessee. G. M. Bentley (September 24): Considerable damage in the counties of western Tennessee where early applications of dusts or sprays were not made. The infestations in the central and eastern counties have been rather spotted. Little injury where proper attention has been directed to treatment.

Ohio. N. F. Howard (September 21): More numerous in the central and northern parts of Ohio than usual. In the central Ohio area beans that have not been treated have suffered heavy damage, and in some cases have been destroyed.

R. H. Nelson (September 22): Numerous the first week of September in the vicinity of South Point, also egg masses and first-instar larvae common on late-planted beans. Adult population much reduced by September 20, apparently leaving the fields to go into hibernation.

SWEETPOTATO FLEA BEETLE (Chaetocnema confinis Crotch)

Georgia. A. L. Brody (September 19): Old lima beans severely damaged but new lima beans in the same garden only lightly affected at Valdosta.

COWPEA CURCULIO (Chalcodermes aeneus Boh.)

Georgia. S. B. Fenne (September 21): Severe injury found in most of southern Georgia throughout the summer. Many complaints received from growers. Damage to garden beans reported from Decatur County.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Virginia. H. G. Walker and L. D. Anderson (September 27): Several fields of snap beans in Norfolk and Princess Anne Counties rather heavily infested.

Georgia. T. L. Bissell (September 7): Cowpeas planted in July have recently been damaged heavily at Experiment. About 10 percent of the leaf surface has been eaten away. Few beetles are in evidence.

A BEETLE (Strigoderma arboricola F.)

Ohio. R. H. Nelson (July 28): Specimens found on bean plant at North Kenova on July 20. (Det. by E. A. Chapin.)

GREEN STINKBUG (Acrosternum hilaris Sav)

West Virginia. F. W. Craig (September 23): Reports from several different sections of the State, and the insect evidently rather common on beans in West Virginia at this time. (Det. by H. G. Barber.)

BEAN APHID (Aphis rumicis L.)

Maryland. F. B. Whittington (August 12): Abundant in several fields in Carroll County on canning beans.

CABBAGE

IMPORTED CABBAGE WORM (Pieris rapae L.)

Connecticut. N. Turner (September 20): Locally very abundant on late crops of cabbage, cauliflower, turnips, and broccoli. Many growers report difficulty in controlling them.

New York. N. Y. State Coll. Agr. News Letter (September 8): On September 3 the cabbage worm situation in Monroe County was unusual. Hordes of butterflies laying eggs fairly freely, but bacterial diseases causing heavy mortalities. During the last few days something seems to have slowed up egg deposition.

Virginia. H. G. Walker and L. D. Anderson (September 27): Butterflies rather numerous but caterpillars not abundant enough to cause much damage at Norfolk.

CABBAGE LOOPER (Autographa brassicae Riley)

Virginia. H. G. Walker and L. D. Anderson (September 27): A rather heavy outbreak occurred in many fields of cabbage, collards, and kale in Norfolk and Princess Anne Counties during the early part of September. However, most of the larvae have died with a disease during the last 10 days.

POTATO APHID (Illinoia solanifolii Ashm.)

Georgia. O. I. Snapp (July 15): This aphid had caused considerable damage to collards at Fort Valley, central Georgia. (Det. by P. W. Mason.)

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. H. G. Walker and L. D. Anderson (September 27): In general, these bugs are rather scarce near Norfolk, but they have caused some injury in a field of early cabbage. A grower has reported that they were rather abundant and injurious on his farm near Exmore, on the Eastern Shore of Virginia. Attacking cabbage and other crucifers.

Maryland. E. N. Cory (September 27): Present generally on cabbage.

Tennessee. G. M. Bentley (September 26): Reported on late cabbage and turnips from different parts of the State.

Mississippi. C. Lyle (September 23): Reported as abundant on fall turnips in Senatobia. Complaints of injury recently received from Lowndes and Madison Counties.

Texas. J. N. Roney (September 22): Reported on collards in Galveston County.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Connecticut. N. Turner (September 20): In general not destructive. A few fields showed a moderate population in September.

South Carolina. J. G. Watts (September): At Ridgeland on squash this insect was common but not abundant. At Blackville, this insect has been scarce on cucumbers and cantaloups.

Ohio. N. F. Howard (September 21): Continues to be numerous in the vicinity of Columbus.

Missouri. L. Haseman (September 21): Where control measures were not applied squash bug now reported as practically ruining late cucurbits, but where early increase was prevented in central Missouri they are very scarce.

Utah. G. F. Knowlton (August 31): From 30 to 150 bugs were found around wilting cantaloup plants in several patches at Bountiful. All plants in one field reported killed and serious injury occurring in several other fields.

SQUASH BORER (Melittia satyriniformis Hbn.)

Texas. R. K. Fletcher (September 22): Reported on squash and cushaw in Galveston County.

MELONS

PICKLEWORM (Diaphania nitidalis Stoll)

South Carolina. J. G. Watts (September 10): At Ridgeland this insect was extremely abundant. At Blackville it was first noticed on late cucumbers late in August. By September 2 they were very abundant and destroying the young fruits before they were 3 inches long. This planting was a total loss. Another planting on July 28 started bearing about September 13 and was at least a 75-percent loss. Cantaloups planted on July 29 had melons the size of golf balls on September 2. A few pickle worms were noticed on September 6 and have continued to increase throughout the month.

Missouri. L. Haseman (September 21): Since about the middle of September late squashes at Columbia show a rather heavy infestation, the late fruits and blossoms providing food. In some cases larvae are maturing in the blossoms without moving to the fruit.

MELONWORM (Diaphania hyalinata L.)

outh Carolina. J. G. Watts (September): On September 10 at Rideland this insect was extremely abundant on squash. Throughout the day thousands of adults could be seen flying about when the plants were disturbed. On cantaloups at Blackville melonworms first appeared on the fall crop about August 20 but were successfully controlled; however, a few have continued to show up through the month. They were about 10 days later appearing on cucumbers than on the cantaloups.

ouisiana. P. K. Harrison (September 24): Abundant on cucumbers at Baton Rouge.

MELON APHID (Aphis gossypii Glow.)

outh Carolina. J. G. Watts (September 15-25): A number of plants scattered generally over the field at Blackville were being severely attacked. At least two predators, Hippodamia convergens Guer. and the larvae of a syrphid fly, were effectively bringing this infestation under control.

Georgia. O. I. Snapp (July 15): This aphid had caused considerable damage to okra at Fort Valley, central Georgia. (Det. by P. W. Mason.)

braska. M. H. Swenk (September 20): Inquiries as to control of the aphid on cucumber and melon vines received from Saline and Hall Counties on August 22 and September 9, respectively.

ah. G. F. Knowlton and F. C. Harnston (August 30): Aphids are damaging cantaloups, cucumbers, and watermelons at Moab.

ASPARAGUS

ASPARAGUS BEETLE (Crioceris asparagi L.)

outh Carolina. J. G. Watts (September): Adults and larvae much less abundant at Blackville than last month. Many fields which were severely damaged during June, July, and August have not put out any appreciable new growth.

TURNIPS

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

ennessee. G. M. Bentley (September 21): Reported as completely killing 6 acres which were planted in turnips at Jefferson City, Jefferson County, the first part of September.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

ah. G. F. Knowlton (September 11): Abundant on onions in northern Utah generally, causing conspicuous silverying.

STRAWBERRY

STRAWBERRY CROWN BORER (Tyloderma fragariae Riley)

Tennessee. G. M. Bentley (September 26): Slight infestations found in Hamilton, Rhea, Meigs, and Roane Counties in the proximity of abandoned fields of strawberries that had not been turned under.

Nebraska. M. H. Srenk (September 20): Reported on September 19 as having damaged strawberry plants in Richardson County.

TOBACCO

TOBACCO FLEA BEETLE (Epitrix parvula F.)

Tennessee. L. B. Scott (September 21): Less abundant in north-central Tennessee than in a normal year. Damage moderate.

HORNWORMS (Protoparce spp.)

North Carolina. G. B. Merrill (August): Tobacco worm (P. quinquemaculata Haw.) moderately abundant on tobacco plants in the Valle Crucis area, Watauga County.

Tennessee. L. B. Scott (September 21): Hornworms less than normally abundant prior to the last week in August when the worms appeared in large numbers. Most of the crop had been harvested. Some of the late-harvested tobacco was seriously damaged in the curing barns.

TOBACCO MOTH (Ephestia elutella Hbn.)

Virginia. C. R. Willey and F. R. Freund (September 22): Larvae were received from Danville on September 8, where they were damaging tobacco, apparently in pack houses. (Det. by W. D. Reed.)

North Carolina. W. H. White (August): The following is taken from E-450, September 1938: "During the latter part of August several reports were received that the tobacco moth was present and injuring tobacco on the sticks in growers' pack houses in North Carolina. The worms or larvae were found by the growers when grading the first curings of tobacco. While the tobacco moth is not a new pest of stored tobacco in this country or in southern Europe, this is the first time the insect has been known to occur in farmers' pack houses and cause any noticeable damage. Over 40 years ago the tobacco moth was known in the United States, but it was not recognized as a pest in tobacco warehouses until 1930, when it was found at Richmond, Va. Since that time the insect has been recognized as a pest of considerable importance in tobacco storage houses and has shown a particular fondness for the imported-cigarette and the flue-cured types of tobaccos."

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. J. G. Watts (September 21): Adults abundant in the few remaining blooms and small bolls in the vicinity of Blackville, Barnwell County. As many as 50 to 75 punctures common on small bolls.

F. F. Bondy and C. F. Rainwater (September 3): Not numerous in the fields of Florence County. (September 17): Very numerous, and cotton taking on a second growth, with many squares and an occasional bloom.

Georgia. T. L. Bissell (September 8): Very injurious in central Georgia. Numbers of weevils migrated early this week.

P. M. Gilmer and P. A. Glick (September 4): Third brood apparently much reduced by excessively high temperatures of the last 2 weeks in Lowndes, Echols, Tift, Berrien, and Cook Counties. Migration not going on to any great extent, but total number of weevils in fields considerably reduced by death and spreading out from the more heavily to the more lightly infested areas. (September 18): Weevils again common in the fields of Tift, Lowndes, Cook, Berrien, Turner, and Douglas Counties, indicating that third-brood individuals are now appearing in considerable numbers. Relatively little indication of oviposition. Fall migration apparently well started. Indications that a somewhat heavier than normal brood will go into hibernation.

Florida. L. C. Fife and C. S. Rude (September 3): Infestation heavy in Alachua, Marion, and Gilchrist Counties. Infestation in Lake County increasing, probably because of migration from other heavily infested areas. Infestation in this county so late and so light that no damage is anticipated. (September 10): Large numbers of weevils expected to go into hibernation. Rather heavy parasitization of larvae in many fields. Most common parasite is Microbracon mellitor Say. Others present but none reared to date. (September 24): Little or no change in weevil conditions. New growth in many fields with squares being punctured as fast as they are large enough. This new second growth will undoubtedly be a serious factor in producing overwintering weevils.

Tennessee. G. M. Bentley (September 12): Small numbers occurring in Shelby and Fayette Counties. None reported in the cotton-growing counties.

Alabama. J. M. Robinson (August 31): Considerable damage done to the top crop and part of the middle crop at Auburn, Lee County, and in many adjoining counties.

Mississippi. C. Lyle (September 23): Far more numerous at this time than for several years. All squares and many fairly large bolls being punctured. Number to enter hibernation will be extremely large, in comparison with past years. Fields of late cotton, poisoned too late or not at all, have suffered heavy damage.

R. L. McGarr and C. A. Wilson (September 10): Thick where cotton is still squaring in Oktibbeha and Lowndes Counties. Unless cotton is stripped by leaf worms (Alabama argillacea Hbn.) and weevils starved out, there should be a large number to go into hibernation. (September 17): Late-planted cotton in Oktibbeha and Lowndes Counties made only about half a crop, low production being chiefly due to boll weevil damage.

E. W. Dunnam, et al. (September 10): Very plentiful and found in all types of cotton in Washington County. Squares still available for food, and all squares heavily damaged as a result of weevil feeding. (September 17): Plentiful in almost all fields. Several noted taking honeydew from nectaries on Sea Island cotton, suggesting that satisfactory food is scarce. Second growth noticeable on some cotton. (September 23): Still plentiful in most fields and plenty of food available.

Louisiana. C. O. Eddy (September): Abundant in late cotton.

M. T. Young and assistants (September 10): Found in great numbers in all fields of young cotton in Madison Parish. (September 21): Food for boll weevils very scarce in Madison Parish before the recent outbreak of cotton leaf worm and now almost entirely absent. Defoliation of cotton should greatly reduce the number of weevils entering hibernation. (September 24): Numerous in fields that have not been completely defoliated.

Oklahoma. C. F. Stiles (September 22): Population has increased in the southeastern quarter of the State during the last month. Very little top crop will be produced in many of the southeastern counties.

F. A. Fenton (September 20): Much more abundant in the vicinity of Stillwater, Payne County, than since 1935, despite defoliation of cotton by cotton leaf worm.

Texas. K. P. Ewing, et al. (September 10): Comparatively scarce, although where squares are present on some late-planted cotton, weevils may be found concentrated in fair numbers.

R. W. Moreland, et al. (September 24): Survey of several fields of late-planted cotton in Brazos and Burleson Counties revealed a fairly heavy weevil population.

GRAPE COLASPIS (Colaspis brunnea F.)

Texas. W. S. Millington (September 22): Production in 3 acres of cotton in Brazoria County completely destroyed by this beetle.

A CERAMBYCID (Prionus sp.)

Alabama. J. M. Robinson (September 26): Mature cotton stalks attacked at Fayette County. Stalks dying after attack by the larvae at the base. Several fields of cotton in this area affected.

COTTON LEAF WORM (Alabama argillacea Hbn.)

- New Hampshire. H. T. Fernald (September 23): Quite an abundance of moths at lights in Concord, Merrimack County, on the evening of September 20.
- Vermont. A. I. Bourne (September 21): Large numbers of moths attracted to blue neon lights and white street lights at Brattleboro, southern Vermont. Few, if any, moths found flying toward or alighting near red lights. Light poles covered with moths during the day.
- Massachusetts. A. I. Bourne (September 21): Swarms of moths first noted about lights on September 14 in Greenfield and vicinity, Franklin County. Very abundant since then.
- New York. R. W. Leiby (September 22): Many parts of the State invaded by moths. Numerous reports received indicating that windows, poles, and parts of houses near strong lights are covered with them at night. Moths apparently reached the State during the night of September 17. Two reports received of mild injury by the moths to ripening grapes and peaches.
- Pennsylvania. C. L. Griswold (September 21): Numerous moths noted on the night of September 20. Especially numerous in Stroudsburg, Monroe County.
- Ohio. T. H. Parks (September 23): Moths abundant around lights and resting on warm surfaces during the day. Ripening peaches injured at Waterville, near Toledo, both on the tree and in baskets in the packing house. Common around street lights during most of September.
- Indiana. J. J. Davis (September 27): Moths appeared in large numbers in many sections of the State, the first report coming on September 12 from Martinsville, Morgan County, where they were attacking everbearing strawberries, causing the fruits to soften and rot. Last report from Huntington, Huntington County, on September 17, where they occurred in enormous numbers at lights.
- Michigan. R. Hutson (September 27): Adults appeared at East Lansing, Ingham County, around lights on about September 3. Appearance and reports of abundances sent in from various parts of the State. No damage reported.
- Tennessee. G. M. Bentley (September 14): Present in spots in the cotton-growing counties of western Tennessee, but injury checked by control measures. Heaviest infestations found in Gibson and Weakley Counties, where little dusting was carried on.
- South Carolina. J. G. Watts (September 12): Moths of the first generation emerging at Blackville, Barnwell County.
- Florida. F. F. Bondy and C. F. Rainwater (September 3): No larvae seen in Florence County.
- Georgia. T. L. Bissell (September 14): Two moths found in buildings at Experiment, having evidently come to lights. None observed on cotton.

Florida. L. C. Fife and C. S. Rude (September 10): Observed in many fields in small numbers in Lake, Alachua, Marion, and Gilchrist Counties during the week. Not defoliating the plants in any fields. (September 24): A few in most fields, except in Lake County.

Alabama. J. M. Robinson (August 31): Active in Fayette, Morgan, Madison, and Calhoun Counties, all in northern Alabama. No report of activity from southern Alabama.

Mississippi. C. Lyle (September 23): A great part of the cotton in Mississippi more or less defoliated during the last month. Some defoliation reported to have occurred in practically every county.

R. L. McGarr, et al. (September 10): A good part of the succulent cotton either stripped or badly ragged in Oktibbeha and Lowndes Counties during the last few days. A large number of the larvae have entered the pupal stage (September 17): Most of the succulent cotton in this section either defoliated or badly ragged.

E. W. Dunnan, et al. (September 10): Much cotton in Washington County being ragged. Many fields completely defoliated. (September 17): Cotton not being completely stripped, thus leaving plenty of food for boll weevil unless stripping is more complete than at present. (September 24): Many fields now completely defoliated, but very little ground movement of worms has occurred.

Louisiana. C. O. Eddy (September): Cotton defoliated in large areas of Louisiana.

M. T. Young and assistants (September 10): Infestation general in Madison Parish. Very little stripping so far but larvae ranging from small to half-grown very numerous in practically all fields. (September 17): Practically all cotton in this parish defoliated during the last week. (September 24): Worms still found in parts of fields that were not completely defoliated. No decrease in yield except probably in a few fields of young cotton, owing to lateness of outbreak.

Missouri. L. Haseman (September 21): A moderate flight of moths noted during September from the south through central Missouri. Moths still present.

Arkansas. D. Isely (September 22): No extensive damage in any part of the State although control measures were necessitated in some localities.

Oklahoma. C. F. Stiles (September 22): Much of the cotton over the State now defoliated.

F. A. Fenton (September 20): Most of the cotton in the vicinity of Stillwater defoliated.

Texas. R. K. Fletcher (September 22): Hundreds of acres of cotton in Ellis County observed on September 3 to have been stripped of leaves.

K. P. Ewing, et al. (September 10): Cotton leaf worms can still be found in most of the old and the young cotton in Calhoun County. Late-planted cotton dusted for control on several farms this week.

R. W. Moreland, et al. (September 3): Some spot dusting done during the week in Brazos and Burleson Counties. (September 10): No damage done in plots in Brazos and Burleson Counties. Spot dusting being continued in young cotton. (September 17): No ragging noticed at any point in Brazos and Burleson Counties during the week. Scattering larvae found in most fields of late-planted cotton, but, so far as known, no dusting has been done. (September 24): No damage during the week. Moths fairly abundant and a few eggs noticed.

A. J. Chapman (September 10): Leaf worms have practically stopped working in the Presidio area, allowing the plants to put on new foliage.

Arizona. W. A. Stevenson (September 17): Some dusting in the Marana section, Pima County, but infestation not very heavy. (September 24): Heaviest infestation found near Tubac, Santa Cruz County, on September 22. Larvae in spots had ragged the top leaves, but most of them were beginning to pupate.

BOLLWORM (Heliothis obsoleta F.)

South Carolina. F. F. Bondy and C. F. Rainwater (September 3): Some bollworms observed damaging bolls in Florence County. (September 17): Some bollworms present and doing some damage in Florence County.

Georgia. T. L. Bissell (September 3): Observed at Experiment and Zebulon, central Georgia, entering cotton bolls and a few attacking pepper fruits.

P. M. Gilmer and P. A. Glick (September 4): Scarce in Lowndes, Echols, Cook, Tift, and Berrien Counties.

Florida. L. C. Fife and C. S. Rude (September 3): Present in all fields in Lake, Alachua, Marion, and Gilchrist Counties to some extent but not serious. (September 17): Present in nearly all fields and in some places considerable damage has been done to the crop. (September 24): Present in small numbers in nearly all fields in the above-mentioned counties, with the exception of Lake.

Mississippi. E. W. Dunnam, et al. (September 3): Few larvae found in Washington County. (September 10): Several thousand acres in southwestern Bolivar County reported as being infested 100 percent.

Arkansas. D. Isely (September 22): Local injury to cotton bolls appeared scattered over the State during late August and early September. Damage considerably more than average, although not so severe as in 1936. This species has also caused some local damage to heads of grain sorghum.

Texas. K. P. Ewing, et al. (September 10): Bollworm just about gone in Calhoun County. Very little damage noticed at present, even in late-planted cotton.

R. W. Moreland, et al. (September 3): Very few eggs or small larvae in plots in Brazos and Burleson Counties at present. (September 17): A few bollworms found in late-planted cotton on September 16 but injury was light. (September 24): In examining 400 tops, an average of 7 eggs were found per 100 terminals. A number of moths noticed in the fields.

A. J. Chapman (September 3): Average bolls per plant in the Presidio area about the same in 1937 and 1938, indicating that bollworms have done very little damage.

Arizona. W. A. Stevenson (September 3): Another brood of bollworms appeared during the week, but in small numbers. Apparent now that they will not occur in damaging numbers.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. R. E. McDonald (August 26): Specimens found in Cameron, Hidalgo, and Willacy Counties. Number of specimens taken indicates a slight increase in infestation in Cameron County. One specimen found in Kleberg County, the first ever found in that county. A few specimens found at the San Antonio laboratory in gin trash from Ward County.

A. J. Chapman (September 3): Average infestation in 12 fields in Presidio County during the week was 82.33 percent, with an average of 4.53 larvae per infested boll. Average infestation in 1937 was 68.14 percent, with 5.10 larvae per infested boll. (September 10): In 16 fields in the Presidio area the average infestation was 95.62 percent, compared to 98.27 in 1937, and the average number of larvae per infested boll was 5.87, as compared with 8.75 in 1937, showing a significant reduction in the average number of larvae per infested boll. (September 17): Average infestation in 24 fields during the week was 96.33 percent, with an average of 6.40 larvae per infested boll. (September 24): Infestation counts made in 12 fields, that had not yet been flooded, during the early part of the week. All fields 100-percent infested, averaging 7.65 larvae per infested boll. A comparison between 8 identical fields in 1938 and 1937 shows the only significant difference to be the reduction in the average number of larvae per infested boll, 7.43 in 1938, compared to 12.23 in 1937. Infestation in 1938 was 100 percent, as in 1937.

Correction: The reports by A. J. Chapman for August 20 and 27 on page 486 of the September issue of the Insect Pest Survey Bulletin should have been included under P. gossypiella instead of Anthonomus grandis Boh.

COTTON SQUARE BORER (Strymon melinus Hbn.)

Texas and New Mexico. R. E. McDonald (August 2): Reported as doing considerable damage in the El Paso, Tex., and Mesilla, N. Mex., Valleys.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Louisiana. B. A. Osterberger and M. W. Mecon (September): Very numerous in all stages on croton weed in central Louisiana on September 23.

Oklahoma. E. E. Ivy (September 21): Large population being built up on croton in the upland and river-bottom areas in the vicinity of Idabel, McCurtain County.

Texas. R. W. Moreland and A. B. Beavers (September 24): Hoppers present in all fields of young cotton visited in Brazos and Burleson Counties.

PLANT BUGS (Miridae)

Texas. K. P. Ewing, et al. (September 10): Several fields of late-planted cotton in Calhoun County inspected during the week and many Adelphocoris rapidus Say and Creontiades debilis Van D. found present in the cotton. Practically all of the squares, both small and large, not already injured by boll weevil, were being injured and shed by these insects. Nearly all the small and many of the half-grown bolls also injured by these bugs, which are believed to be causing more damage just now to late-planted cotton than any other insect in the field. From two to three of these mirids could be found in many of the large squares.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Texas. R. K. Fletcher (September 22): Abundant on young cotton in several fields in Dallas County on September 3.

COTTON STAINER (Dysdercus suturellus H. S.)

Florida. L. C. Fife and C. S. Rude (September 3): In many fields in Lake, Alachua, Marion, and Gilchrist Counties. It first made its appearance on the southern edge of the cotton-growing region and has spread rapidly to the north. (September 10): Increasing rapidly. (September 17): Doing considerable damage in some sections. Control measures being used. (September 24): In the above-mentioned counties, except Lake County, many reports continue to come in, but often there are only a few in the fields from which they are reported. Numerous and injurious in some places. Apparently a much heavier infestation in other sections of the State. Control measures still being applied.

WHITEFLIES (Aleyrodidae)

Mississippi. E. W. Dunnam and J. C. Clark (September 3): Whiteflies are gradually building up in rank cotton in Washington County. Existing infestation exceeds any that has ever come to our attention. Apparently, conditions conducive to aphid reproduction also favor whitefly reproduction.

E. W. Dunnam (August 12): Whiteflies (Trialeurodes abutilonea Hald.) collected on cotton leaves at Stoneville, Washington County. (Det. by P. W. Mason.)

F O R E S T A N D S H A D E - T R E E I N S E C T S

MOTHS (Lepidoptera).

Connecticut. J. V. Schaffner, Jr. (September 22): Late in August and early in September the foliage in mixed hardwood stands in Middlesex County showed varying degrees of defoliation. Larvae of some 50 species of Lepidoptera were found more or less common in this area. The species most common and undoubtedly responsible for the greater part of defoliation, include Anisota senatoria S. & A., Symmerista albifrons S. & A., Heterocampa mantco Dbldy., Halisidota tessularis S. & A., Halisidota caryae Harr., Datana contracta Walk., Datana ministra Drury, and Telea polyphenus Cram.

FALL WEBWORM (Hyphantria cunea Drury)

Connecticut. M. P. Zappe (September 20): Very abundant in Fairfield County, southern Connecticut, on a variety of plants. Rest of State not so heavily infested.

Virginia. H. G. Walker (August 29): Larvae are very abundant this fall, doing considerable damage in southeastern Virginia. (Det. by C. Heinrich.)

North Carolina. Z. P. Metcalf (September 30): More abundant throughout the State on persimmon, pecan, and sourwood, than observed during the last 30 years.

Florida. J. R. Watson (September 24): More abundant than usual during August and the first part of September, especially on pecans and persimmon.

A. H. Madden (September 20): Moderately abundant on pecan trees in Gadsden County during the last few weeks.

Mississippi. C. Lyle (September 23): Found attacking pecan trees throughout the Aberdeen district, Monroe County, although doing no serious damage. Scarce in the Poplarville area, Pearl River County.

Tennessee. G. M. Bentley (September 9): Found in large quantities on various trees in the western counties. Very few nests occur in central and eastern Tennessee. Usually Hyphantria occurs in large numbers in the central counties, but this year there are surprisingly few.

Indiana. J. J. Davis (September 27): Normally abundant in all parts of the State.

Wisconsin. C. L. Fluke (September 21): Very plentiful in the eastern and southern parts of the State.

A CATERPILLAR (Heterocampa manteo Dbldy.)

Connecticut. R. B. Friend (September 22): Unusually abundant on oak and American beech at Killingworth, Middlesex County, and Litchfield, Litchfield County.

Virginia. C. R. Willey (September 6): Occurred in large numbers and totally defoliated seven 25-foot linden trees at Greenwood, Albermarle County. (Det. by C. Heinrich.)

Minnesota. A. G. Ruggles and C. E. Mickel (September 13): Reported as defoliating basswood in the northern and central parts of the State.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Minnesota. A. G. Ruggles and assistants (August 23): Very abundant on black walnut in Ramsey County.

TENT CATERPILLAR (Malacosoma sp.)

Utah. G. F. Knowlton and F. C. Harmston (September 10): Seriously damaged the foliage of apple and cottonwood trees. Annoyance reported from their crawling through openings around screens and doors and becoming household pests.

TWIG PRUNER (Hypermallus villosus F.)

Missouri. L. Haseman (September 21): Unusually abundant on fruit trees, as well as on forest and shade trees, at Columbia. Fruit growers throughout the State are complaining about it this fall.

WALKINGSTICK (Diapheromera femorata Say)

Pennsylvania. F. W. Graham (September 12): Many of the woodland trees on State Highway 45, 2 miles east of Woodward, Centre County, entirely defoliated. Average defoliation, 55 to 60 percent.

A. F. Burgess (August 25): A severe infestation reported in the eastern part of Carbon County. It is estimated that defoliation averages from 10 to 15 percent in an area of approximately 200 acres, and some individual trees are from 75 to 85 percent defoliated. In this area the woodland growth consists of white, red, scarlet, chestnut, and scrub oaks, and sassafras, aspen, red maple, chestnut sprouts, and pine. Except for the pine and sassafras, noticeable feeding has taken place on all of this growth. Insects have not reached maturity and it is estimated that feeding will continue for a period of 3 or 4 weeks. A smaller outbreak of this insect reported in Polk Township, Monroe County.

AN APHID (Longistigma caryae Harr.)

New York. E. P. Felt (September 23): Found in some numbers near Westbury, western Long Island.

New Jersey. M. D. Leonard (September 24): Sycamores on streets at Haddonfield, Camden County, beginning to develop small colonies on underside of branches. A few alates can be found and these are in flight to some extent.

ASH

A BEETLE (Xyloryctes satyrus F.)

Iowa. C. J. Drake (September 15): Reported as defoliating a growth of ash trees near Salix, western Iowa. Another report from western Iowa state that the insects were seriously damaging the roots of ash trees.

BIRCH

BRONZED BIRCH BORER (Agrilus anxius Gory)

Ohio. E. W. Mendenhall (September 17): Birch trees in Delaware found infested. Some are dying and other birch trees are already dead.

CATALPA

CATALPA SPHINX (Ceratonia catalpae Bdv.)

Indiana. J. J. Davis (September 27): Responsible for defoliation of catalpa throughout the State.

CYPRESS

COTTONY CYPRESS SCALE (Ehrhornia cupressi Ehrh.)

California. Kern County Monthly News Letter (September 6): Damage to shade trees being reported frequently in Kern County. On the increase on Monterey cypress trees and hedges and in some instances the trees are injured to the extent that it is advisable to destroy them.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Utah. G. F. Knowlton (September 8): Seventeen elm trees at Smithfield, Cache County, severely damaged. Some of the trees have the foliage largely brown and have thrown out a weak growth of leaves at the ends of the twigs.

California. Kern County News Letter (September 6): Many unsprayed elm trees in Kern County completely defoliated as a result of attacks of elm leaf beetle. Some elms are putting out new leaves.

LARCH

LARCH SAWFLY (Lygaeonematus erichsonii Htg.)

Wisconsin. H. J. MacAloney (September 14): A larch swamp north of Slinger, Washington County, showed noticeable defoliation the last week in August.

LOCUST

LOCUST BORER (Cyllene robiniae Forst.)

Illinois. W. P. Flint (September 23): Adults have been noted in slightly more than usual numbers on goldenrod in the vicinity of locust plantations.

MAPLE

GREEN-STRIPED MAPLE WORM (Anisota rubicunda F.)

Michigan and Minnesota. H. J. McAloney (September 14): Roadside trees completely defoliated early in August in northern Michigan and Minnesota.

UNICORN CATERPILLAR (Schizura unicornis S. & A.)

Indiana. J. J. Davis (September 27): Sent in from New Albany, Floyd County, on September 12. Reported as feeding on maple foliage.

NORWAY MAPLE APHID (Periphyllus lyropictus Kess.)

New Jersey. M. D. Leonard (September 24): Many street maple trees in Haddonfield recently show increasing infestation, with some evidences of honeydew spotting cars parked in some streets. Infestation fairly light to date and alates very scarce. This aphid present in only very small numbers for the last month or so.

Maryland. E. N. Cory (August 15): Present on Norway maple at Pikesville, Baltimore County.

OAK

ORANGE-STRIPED OAK WORM (Anisota senatoria S. & A.)

Connecticut. R. B. Friend (September 22): Abundant on oak throughout the State.

E. P. Felt (September 23): Reported as somewhat abundant on oak at Old Lyme.

Virginia. C. R. Willey and F. R. Freund (September 22): Much more abundant this year than for many years in Richmond and vicinity. Many ornamental oaks defoliated and many thousands of trees in the cutover areas where the second growth is from 6 to 15 feet tall.

A TUSSOCK MOTH (Olone achatina S. & A.)

Connecticut. E. P. Felt (September 23): Larvae were generally abundant on white, red, and black oaks at Stamford and Danbury, skeletonizing the underside of the leaves on the lower exposed branches, particularly along roadsides. This is the first year in a decade in which the larvae have attracted notice.

A GALL INSECT (Neuroterus saltatorius Edwards)

California. G. H. Kaloostian (August 23): Specimens of galls on the leaves of valley oak were brought in from Parlier, Fresno County. Galls collected by the thousands and could be heard at night. Dissection revealed immature and mature larvae and a pupa.

GOLDEN OAK SCALE (Asterolecanium variolosum Ratz.)

Massachusetts. E. P. Felt (September 23): Sufficiently abundant to rather seriously injure English oaks at Weston, Middlesex County.

TWO-LINED CHESTNUT BORER (Agrilus bilineatus Web.)

Delaware. E. P. Felt (September 23): Was reported as somewhat injurious on large oaks near Wilmington.

PINE

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

Connecticut. E. P. Felt (September 23): Present in moderate numbers on Austrian pine at Greenwich.

NANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.)

Delaware. E. P. Felt (September 23): Found in somewhat injurious numbers on pine near Wilmington.

Tennessee. G. M. Bentley (September 26): Found doing damage to evergreens at Columbia, Maury County. (Det. by C. Heinrich.)

A SAWFLY (Diprion frutetorum F.)

New Jersey. C. W. Collins (September 20): On July 11, 1938, C. L. Griswold made a collection of sawfly cocoons from litter under red pine at Lamington, Somerset County. Miss G. A. Sandhouse determined the adult as D. frutetorum and remarked that this was the first identification of this European species from the United States, although two specimens in the National Museum collection apparently belong to the same species. One specimen is from Ithaca, N. Y., and the other from Rye, N. Y. D. frutetorum was found infesting Scotch pine near Niagara Falls, Ontario, in 1934, and in the autumn of 1937 its known distribution in the Niagara Peninsula extended from Niagara Falls, Ontario, to Fort Erie, Ontario.

SAWFLIES (Neodiprion spp.)

Mississippi. C. Lyle (September 23): Larvae of N. lecontei Fitch sent in on September 12 with the report that about 40 acres of pine timber at Escatawpa, Jackson County, were being defoliated. Damage to pine by this species reported from Summit, Pike County, on September 1, while specimens were sent in from Brookhaven, Lincoln County, with a report that a Cedrus deodara tree, 30 feet tall, is being defoliated.

Ohio. T. H. Parks (September 23): Specimens of Abbott's sawfly (N. abbotii Leach) received from four widely separated localities, with the statement that they were defoliating new pine plantings.

Michigan. R. Hutson (September 27): Abbott's sawfly has been reported from Richland, Grand Rapids, and Jackson.

Iowa. C. J. Drake (September 15): N. abbotii reported as defoliating trees at Coon Rapids, Carroll County, and Davenport, Scott County.

Minnesota. A. G. Ruggles and C. E. Mickel (September 13): Neodiprion sp. near lecontei reported as defoliating jack pine in the southeastern part of Minnesota.

SOUTHERN PINE SAWYER (Monochamus titillator F.)

Mississippi. C. Lyle (September 23): Specimens taken from pine trees at Gulfport sent in on August 29, with the statement that a number of trees were dying.

WHITE-PINE WEEVIL (Pissodes strobi Peck)

Pennsylvania. E. J. Udine (September 3): Adult weevils emerging from dead leaders of white pine at Laporte, Sullivan County. Elevation 2,047 feet.

Michigan. R. Hutson (September 27): Sent in from Remus, Mecosta County, where it was reported as infesting several acres of pine and spruce.

PINE BARK APHID (Pineus strobi Htg.)

Ohio. E. W. Mendenhall (September 7): Found moderately abundant on white pine at Gahanna, Franklin County.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

New York. R. E. Horsey (September 23): A group of five large red pines, 30 to 40 feet in height, in an ornamental planting at Rochester, were badly infested, almost every needle having several scales on it.

Ohio. E. W. Mendenhall (September 15): Quite serious on the pines in a nursery in Newark, Licking County. Often infests mugho pine.

Alabama. J. M. Robinson (August 31): Reported on pine at Tarrant, Jefferson County, on August 27.

Tennessee. G. M. Bentley (August 29): Found on spruce trees at Elizabethton, Carter County. (Det. by H. Morrison.)

Nebraska. M. H. Swenk (September 20): Black Hills spruce infested in Buffalo County on September 12.

Utah. G. F. Knowlton (September 14): Austrian pine foliage damaged this season on the campus at Logan.

SCOTCH PINE LECANIUM (Toumeyella numismaticum P. & McD.)

Ohio. E. W. Mendenhall (September 9): Quite abundant and doing some damage to Chinese pine trees in a nursery.

POPLAR

A LEAF BEETLE (Chrysomela tremulae F.)

Minnesota. H. J. McAloney (September 14): Complete defoliation of young aspen trees in small groups on the Kawishiwi Ranger District, Superior National Forest. Larvae were full grown on August 17.

AN APHID (Periphyllus populicola Thos.)

Utah. G. F. Knowlton (September 14): Poplar twigs frequently heavily infested by this aphid.

SPRUCE

SPRUCE BUDWORM (Cacoecia fumiferana Clem.)

Minnesota. A. G. Ruggles and C. E. Mickel (September 13): Reported as very abundant.

SPRUCE NEEDLE MINER (Recurvaria piceaella Kearf.)

Wisconsin. H. J. MacAloney (September 14): Somewhat common on black spruce on the Chequamegon National Forest, Mineral Lake Ranger District, but the attack is usually light and little damage is evident. Larvae found on August 23.

EASTERN SPRUCE BEETLE (Dendroctonus piceaperda Hopk.)

New Hampshire and Vermont. T. J. Parr (September 23): Infestations in the northern division of the Green Mountain National Forest, Vt., are decreasing. The number of infested trees on survey strips was considerably less than in 1936 or 1937. Very light infestations in the mature spruce stands in the Waterville Valley section of the White Mountain National Forest, N. H.

SYCAMORE

SYCAMORE LEAF ROLLER (Ancylis platanana Clem.)

Connecticut. M. P. Zappe (September 20): Larvae very abundant on sycamore trees throughout the State. On some trees nearly 50 percent of the leaves have been rolled and eaten.

A TUSSOCK MOTH (Halisidota sp.)

New Jersey, Delaware, and Virginia. H. W. Allen (September 16): Widespread and severe defoliation of sycamores noted in Accomac and Northampton Counties, Va., and, considerable feeding on the same trees in Delaware and southern New Jersey, caused by two species of caterpillars. The one chiefly responsible for the damage is Halisidota sp., presumably harrisi Walsh. (Det. by C. Heinrich.)

TULIPTREE

A LEAF MINER (Phyllocnistis liriiodendrella Clem.)

New Hampshire. E. P. Felt (September 23): Found in small numbers on tulip-trees at Center Harbor, Belknap County.

WALNUT

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Ohio. T. H. Parks (September 23): Serious defoliation to walnut.

Iowa. C. J. Drake (September 15): Reported as defoliating walnut trees in every county of the State.

WILLOW

POPLAR AND WILLOW BORER (Cryptorhynchus lapathi L.)

Oregon. D. C. Mote (September): Adults emerged in August in the Willamette-Columbia River bottom in normal abundance. Damage severe on flood-land willow.

AN APHID (Melanoxantherium smithiae Monell)

Indiana. J. J. Davis (September 27): Damaging willow in many places throughout the State.

A GALL INSECT (Rhabdophaga strobiloides Walsh)

Nebraska. M. H. Swenk (September 20): Found on willow in Antelope County on September 5.

INSECTS AFFECTING GREENHOUSE
AND ORNAMENTAL PLANTS

AN APHID (Prociphilus erigeronensis Thomas)

Michigan. R. Hutson (September 27): The aster root aphid has been brought in from Detroit and is reported as injuring several kinds of garden plants.

GARDEN FLEA HOPPER (Halticus citri Ashm.)

New Jersey. M. D. Leonard (September 23): Fairly common at Haddonfield. Leaves of ageratum considerably stippled with the feeding punctures on all the plants in a large ornamental border. The short-winged form greatly predominated. Damage is light.

Virginia. C. R. Willey and F. R. Freund (September 22): Numerous in flower gardens in Richmond this season, especially on verbenas. A large garden patch of pole butterbeans observed to have been ruined by this pest in Loudoun County, near Round Hill, on July 12.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Alabama. J. M. Robinson (August 31): Reported on boxwood at Uriah, Monroe County, on August 10, and at Atmore on August 24.

Mississippi. C. Lyle (September 23): A fairly heavy infestation found at Moss Point during the last month.

WHITE PEACH SCALE (Aulacaspis pentagona Targ.)

Virginia. C. R. Willey and F. R. Freund (September 22): Apparently steadily increasing in Richmond. Calls for information and control received practically every day.

GREENHOUSE WHITEFLY (Trialeurodes vaporariorum Westw.)

Georgia. T. L. Bissell (September 14): Garderia near Griffin, Spalding County, heavily infested with whitefly. Leaves have many eggs and a heavy covering of sooty mold.

CITRUS MEALYBUG (Pseudococcus citri Risso)

Nebraska. M. H. Sventk (September 20): Found attacking geraniums and foliage plants in Cuming County on August 22.

ARBORVITAE

A MITE (Paratetranychus alpinus McG.)

Washington. E. J. Newcomer (July 19): Common on Thuja occidentalis at Yakima and, according to McGregor, not previously reported from Washington. (Det. by E. A. McGregor.)

AZALEA

AZALEA SCALE (Eriococcus azaleae Comst.)

Alabama. J. M. Robinson (August 31): Reported on azaleas at Atmore on August 24.

Mississippi. C. Lyle (September 23): On azaleas received from Summit, Pike County, on September 17. Steps are being taken to eradicate this infestation.

AZALEA LACEBUG (Stephanitis pyrioides Scott)

New Jersey. M. D. Leonard (September 16): At Haddonfield several small azalea shrubs, about knee high, badly infested with this bug, almost every leaf on about half of the plants being a rusty color.

BAMBOO

BAMBOO SCALES (Asterolecanium spp.)

Florida. E. A. Back (September): Scales infesting bamboo of the small variety produced so much honeydew, and resulting blackening of leaves and nodes, that swarms of honey bees, wasps, and hornets were found during June, feeding on the honeydew. (Det. by Louise M. Russell as A. bambusae Bdv. and A. miliaris Bdv.)

CHRYSANTHEMUM

CHRYSANTHEMUM LEAF MINER (Phytomyza chrysanthemi Kowarz)

Mississippi. L. J. Goodgame (September 23): Chrysanthemum leaves showing injury received on September 21 from a greenhouse in Tupelo, Lee County.

STALK BORER (Papaipema nebris nitela Guen.)

North Carolina. Z. P. Metcalf (September 30): Chrysanthemums in Wilson County and ornamentals throughout the State being attacked by the common stalk borer.

CHRYSANTHEMUM APHID (Macrosiphoniella sanborni Gill.)

New Jersey. M. D. Leonard (September 17): Winged and wingless forms present on a number of plants but not abundant at Haddonfield. Damage light.

COLUMBINE

COLUMBINE LEAF MINER (Phytomyza minuscula Gour.)

New Jersey. M. D. Leonard (September 16): A number of plants in several gardens in Ridgewood badly infested from mid-August to mid-September.

Believed to be worse than last year. Some of the plants have almost every leaf heavily mined and visibly affected.

NOTE: P. minuscule is abundant throughout North America, wherever Aquilegia grows. It has been confused in American literature with P. aquilegiae Hardy, which probably does not occur in North America. (S. W. Frost, Ann. Ent. Soc. Amer. 23, pp. 457-460 1930.)

AN APHID (Myzus essigi G. & P.)

New Jersey. M. D. Leonard (September 16): A number of plants in a garden at Ridgewood, observed for several seasons, had almost no aphids until late in August, and early in September the infestation was still very light. This seems to be the common species in the State wherever observations have been made.

DAHLIA

A FLEA HOPPER (Halticus bractatus Say)

Georgia. T. L. Bissell (September 2): Killing the leaves of some varieties of dahlia at Hapeville.

A FLY (Tephritis finalis Loew)

Georgia. T. L. Bissell (September 2): Flies observed ovipositing on dahlia blooms today at Hapeville. Maggots work down and feed at the base of the petals.

GLADIOLUS

GLADIOLUS THRIPS (Teniothrips simplex Morison)

North Carolina. Z. P. Metcalf (September 30): Observed to be doing serious damage in Wilson County.

Ohio. E. W. Mendenhall (September 17): Numerous in some of the gladiolus plantations at Delaware, Delaware County.

Utah. G. E. Knowlton (September 14): Thrips have not been unusually abundant on gladiolus examined this season in northern Utah.

HIBISCUS

A PLANT BUG (Corizus sidae F.)

Arkansas. W. F. Turner (September 12): All stages very abundant on cultivated hibiscus at Little Rock. Massed on the seed pods and their petioles, and so abundant as to produce an obvious staining of the foliage. (Det. by H. G. Barber.)

JUNIPER

JUNIPER SCALE (Diaspis carueli Targ.-Tozz.)

Maryland. G. S. Langford (September 27): Present generally in the State on Irish juniper.

Virginia. C. R. Willey and F. R. Fraund (September 22): Unusually abundant this season on Irish juniper in the nurseries in eastern Virginia, from Arlington to Norfolk. Apparently a rather rapid spread and build-up has occurred.

Alabama. J. M. Robinson (August 31): Reported on juniper at Tarrant on August 27.

Ohio. E. W. Mendenhall (September 20): Abundant on juniper trees in a nursery at Mount Pleasant, Jefferson County.

Michigan. R. Hutson (September 27): Very abundant at Detroit, Benton Harbor, Monroe, Grand Rapids, Grand Haven, Ann Arbor, Jackson, Constantine, Sturgis, and Howell.

JUNIPER WEBWORM (Dichomeris marginellus F.)

Michigan. R. Hutson (September 27): Infesting Irish juniper at Constantine, Benton Harbor, Monroe, Detroit, Lansing, Grand Rapids, and Kalamazoo.

Maryland. G. S. Langford (September 27): Present generally throughout the State on juniper (Juniperus communis).

LILAC

LILAC BORER (Podosesia syringae Harr.)

Nebraska. M. H. Swenk (September 20): Found infesting a lilac bush in Burt County on August 24 and reported as doing similar damage in Douglas County on August 27.

PRIVET

PRIVET THRIPS (Dendrothrips ornatus Jabl.)

Indiana. J. J. Davis (September 27): First observed in Indiana last year. Generally abundant throughout the State this year and causing severe silverying of the foliage of privet. (Det. by J. D. Hood.)

RHODODENDRON

RHODODENDRON LACEBUG (Stephanitis rhododendri Horv.)

New Jersey. M. D. Leonard (September 16): Scarce to absent on many plants at Ridgewood during August although there are evidences of considerable infestation on older leaves earlier in the summer.

ROSE

TARNISHED PLANT BUG (Lycus pratensis L.)

Indiana. J. J. Davis (September 27): Sent in from Greensburg, Decatur County, on September 14. Blasting rosebuds and causing the buds to grow in a deformed manner.

ROSE APHID (Macrosiphum rosae L.)

New Jersey. M. D. Leonard (September 23): Small colonies are present on the tender terminal shoots only of a number of climbing roses in a garden at Haddonfield. Alates scarce. Damage is negligible.

VERBENA

A WEEVIL (Artipus texanus Pierce)

Mississippi. G. L. Bord (September 23): Present in moderate numbers on verbena at Lucedale on August 22.

VIRGINIA CREEPER

GRAPE LEAFHOPPER (Erythroneura comes Say)

Nebraska. M. H. Swenk (September 20): Proving troublesome on woodbine in Perkins County on August 25.

Utah. G. F. Knowlton (September 7): Virginia creepers have from 25 to 90 percent dry, brown leaves on many ornamental vines observed in northern Utah counties owing to attack by this insect. (September 14): Damage to Virginia creepers more serious and widespread each week.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MAN

MOSQUITOES (Culicinae)

Georgia. J. B. Hull (August 31): The smallest number of salt marsh mosquitoes (Aedes sollicitans Walk.) within the last 4 years has been reported by residents of the coastal islands and the coastal section of the State. The scarcity of mosquitoes appears to be due to the decreased rainfall in these areas and to the mosquito-control work.

Tennessee. G. M. Bentley (September 26): Aedes aegypti L. was common in offices and homes during the late summer and early fall months.

Missouri. L. Haseman (September 21): During the month some species of mosquitoes have continued to be annoying and since the middle of the

month have been breeding abundantly in rain barrels at Columbia. However, there seems to be a scarcity of Anopheles spp. in this area. It is observed that Missouri has again been having a rather heavy epidemic of sleeping sickness of horses, particularly in the northern half of the State.

EYE GNATS (Hippelates spp.)

Texas. H. M. Brundrett (August 30): Eye gnats, tentatively determined as E. dorsatus Loew, were numerous enough August 17 to be quite annoying on the Wakefield ranch, 5 miles south of Uvalde. About 20 gnats per person were noted.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Maryland. E. N. Cory (September 7): Nymphs were found on dogs and in animals' bedding at Annapolis and Baltimore.

BLACK WIDOW SPIDER (Latrodectus mactans F.)

New Jersey. H. C. Donohoe (September 10): Noted in considerable numbers during the summer in the vicinity of Trenton. At White Horse they have been abundant in the office buildings, storages, cellars, and out-of-doors about the buildings. Recently, in rearranging a 9 x 10-foot storage space, seven immature females were killed and many more were observed.

Delaware. H. C. Donohoe (September 10): Noted in considerable numbers during the summer at Dover and Edge Moor.

Maryland. H. C. Donohoe (September 10): Noted in considerable numbers during the summer at Salisbury and Eden.

North Carolina. J. F. Cooper (September 23): Two reports received in Salisbury during the summer. Six adult females encountered in Spencer since September 1.

Washington. E. J. Newcomer (September): This spider appears to be more numerous at Yakima than usual, having been reported from orchards, basements, garages, etc. Several people have reported killing from 15 to 20 of the spiders on their premises.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

Illinois. W. P. Flint (September 23): There is a considerable outbreak of the screwworm in an area in the north-central part of the State, and damage has been reported in separate areas in the west-central part.

Georgia. T. L. Bissell (September 3): A case reported in the nose of a

steer on September 1, from Milner, central Georgia.

A. L. Brody (September 19): This insect has increased markedly in southern Georgia during the last month. Numerous cases reported in the vicinity of Valdosta. Natural infestations observed in dogs, cattle, sheep, and pigs. Incidence on artificially wounded animals at the Experimental Farm exceedingly high. Since August 20 there have been 202 infestations recorded, the greatest number occurring from September 10 to 19.

Florida. J. B. Hull (August 31): Reported causing considerable loss on one large farm near Fort Pierce, and complaints received from other livestock owners in that vicinity.

A. H. Madden (September 20): Stock raisers in Gadsden County report that a considerable number of cases have occurred during the last 2 or 3 weeks.

Tennessee. G. M. Bentley (September 26): The screwworm survey continuing throughout the spring and summer has revealed infestations in Shelby, Fayette, and Tipton Counties. These were rather light. All infestations were traced back to cattle shipped into the State from infested areas.

Texas. H. M. Brundrett (August 31): Screwworms not numerous in the vicinity of Uvalde during the first half of August but with the advent of summer shearing the number of cases has increased markedly. Scattered cases were present through the month, with a few reported instances of numerous cases in sheep and goats. These were largely infestations in the mouths of the animals owing to their feeding on pricklypear.

HORNFLY (Haematobia irritans L.)

North Carolina. G. B. Merrill (August): Horn fly moderately abundant in the Valle Crucis area, Watauga County, in August. Elevation around 3,000 feet.

Florida. A. L. Brody (September 19): Averaged at least 1,000 per animal on a farm 5 miles northeast of Monticello, Jefferson County.

Missouri. L. Haseman (September 21): During the month horn flies have continued to be quite abundant and annoying to livestock throughout central Missouri.

Texas. H. M. Brundrett (August 30): In the northern part of Kinney County, 15 miles north of Brackettville, 25 head of cattle were examined and found to be practically free of horn flies. One steer had about 25.

STABLEFLY (Stomoxys calcitrans L.)

Georgia. J. B. Hull (September 15): Recently unusually abundant on the coast. Believed to be more numerous than at any time since 1935, and residents state that they have not been so bad in the last 10 years. Their bites have caused several cases of screwworms on hogs and dogs.

Only cases observed have been around the ears, where the animals in rubbing or scratching have broken the skin.

Missouri. L. Haseman (September 21): During the month stableflies have continued to be especially abundant and annoying to livestock throughout central Missouri.

LONE STAR TICK (Ambylomma americanum L.)

Florida. A. L. Brody (September 19): One specimen collected on September 6 from cattle at Brooksville, Hernando County.

FLESH FLIES (Sarcophaga sp.)

Georgia. A. L. Brody (September 19): Nine infestations of blowfly have occurred on experimentally wounded animals during the last month at Valdosta.

HORSES

HORSE BOTFLY (Gastrophilus intestinalis Deg.)

Missouri. L. Haesman (September 21): In north-central Missouri the common botfly was apparently more active than usual during the early part of September, seemingly much later than we normally expect heavy oviposition. Reports from some autopsies indicated that this year the bots remained in the stomachs of horses much later than normal, which may account for the abundance of this fly in September.

HORSEFLIES (Tabanidae)

Texas. H. M. Brundrett (August 11): Twenty-five cows examined at Concan, Uvalde County, showed about 50 horseflies each. (August 16): Forty tabanids collected from two cows near Uvalde in 30 minutes, and not all were captured. Tabanids have been unusually abundant during August. (August 18): Hundreds of fresh egg masses of horseflies noted on rocks above the water on the Nueces River. Over 200 masses were counted on each of 2 rocks, neither rock being over 12 inches square. Near the end of August the tabanid population diminished rapidly, having been most abundant after August 1.

O. G. Babcock (September 14): Tabanids present, well distributed, but not numerous over the Edwards plateau, northwest of Sonora.

Utah. G. F. Knowlton (September 13): Horseflies are annoying livestock at West Weber, Tabanus sonomensis O. S. being the most abundant species.

California. G. H. Kaloostian (August 25): A rancher in the Fowler district, Fresno County, reported killing 30 horseflies (T. punctifer O. S.) in 1 day on 1 mule. He also stated that these flies came in groups of 4 or 5 and that about as many as he killed got away. The high-water table resulting in permanent ponds is probably the main factor in the increase of horseflies in this locality. Ponds around Fowler have had water in them throughout the year for the last 2 years.

BUFFALO GNATS (Simulium sp.)

Texas. H. M. Brundrett (July 11): Thousands of larvae of all sizes and pupae found breeding in falls at Tom Nunn Crossing, on the Nueces River. (July 28): Following a 6-foot rise of the Nueces, no larvae or pupae found at the falls. (August 13): Larvae, none more than one-fourth full size, again present on the rocks of the falls by thousands. No pupae present.

POULTRY

STICKTIGHT FLEA (Echidnophaga gallinacea Westw.)

Oklahoma. F. A. Fenton (September 20): Reported on chickens at Snow, Pushmataha County.

FOWL TICK (Argas miniatus Koch)

Oklahoma. F. A. Fenton (September 20): Reported on chickens at Weatherford, Custer County.

SHEEP AND GOAT

SHEEP BOTFLY (Oestrus ovis L.)

Georgia. A. L. Brody (September 19): Eight out of 11 goat heads dissected at Valdosta during the last month contained larvae of the nose bot. All stages from first- to third-instar larvae collected.

Texas. O. G. Babcock (August 21): Flies on the increase for the last 2 weeks. Considerable activity noticed at Sonora.

RABBITS

RABBIT TICK (Haemaphysalis leporis-palustris Pack.)

Texas. H. M. Brundrett (August 30): During August all stages of rabbit ticks were found to be abundant on jack rabbits and cottontails taken in the vicinity of Uvalde.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

ANTS (Formicidae)

Maryland. E. N. Cory (September 23): Generally present in the State in houses and on lawns.

Florida. E. A. Back (September): Ants collected in June at St. Leo have been identified as Camponotus abdominalis subsp. floridanus Buckley, (nesting in clay soil and extending nest into hollow of dead giant bamboo, perforating nodes to permit use of adjoining hollow spaces). Second colony in decaying camphor stump. Abundant about buildings and grounds feeding on dead insects and sweets were Dorymyrmex

pyramicus var. flavus McCook. Polytonomyrmex bodius Latr. is a serious pest of lawns, destroying grass and vegetation about nests. (Det. by M. R. Smith.)

Mississippi. C. Lyle (September 23): Many complaints received regarding Solenopsis xyloni McCook and other native ants during the last month, indicating that ants are more troublesome than usual.

Texas. E. A. Back (September): On June 7, Crematogaster caryae subsp. discolor Buckley, reported from Houston as found around water and usually colonizing in walls of house. (Det. by M. R. Smith.)

FIELD CRICKET (Gryllus assimilis F.)

New Jersey and Florida. E. A. Back (September): Reported as entering a bungalow on the shore at Belleville, N. J., and eating curtains and bedding. Reported as having been captured flying in numbers to lights of stores at Daytona Beach, Fla., in June. (Det. by A. B. Gurney.)

Nebraska. M. H. Swenk (September 20): Reported as the cause of annoyance in basements in Colfax and Furnas Counties late in August and early in September.

California. E. O. Essig (September 10): Common field cricket unusually abundant in the San Francisco Bay region, but also common in the San Joaquin and Sacramento Valleys. Yuba City area crickets parasitized by Mermis sp.

HOUSE CRICKET (Gryllus domesticus L.)

New York, Pennsylvania, and Ohio. E. A. Back (September): The New York Times of August 3 gives an account of "The Cricket on the Hearth" in Rochester, N. Y., where the outbreak of this pest was said to be the worst in the history of the city. Very abundant on August 18 in a cottage at Rockaway Beach, N. Y. Abundant in public dump and nearby houses in Springfield, Pa., on August 13 and 29. Very abundant in cellar of a house in Dayton, Ohio.

Oklahoma. R. G. Dahms (September 20): This cricket reported as abundant in homes and stores in many localities in southwestern Oklahoma.

EUROPEAN EARWIG (Forficula auricularia L.)

Massachusetts and New York. E. A. Back (September): On July 22 a correspondent at Pottersville, Mass., reported this insect present in houses. On August 28 at Swansea, Mass., a correspondent wrote of having first observed earwigs 2 years ago. Now they are abundant on clothing on the line and they "bite or sting when they get on you." On August 10 a specimen was received from Rochester, N. Y. (Det. by A. B. Gurney.)

Alabama. J. M. Robinson (August 31): European earwig reported on potato at Fort Wayne on August 24.

Idaho and Washington. B. J. Landis (September 20): More abundant than previously observed at Pullman, Walla Walla, and Ellensburg, Wash., and at Moscow, Idaho. Damage done in flower and vegetable gardens. Sweet corn showing considerable damage at Pullman and Moscow, and potatoes at Moscow.

Utah. G. F. Knowlton (September 14): Reported as infesting sweet corn ears in the infested part of Farmington.

AN EARTWIG (Anisolabis maritima Bonelli).

Massachusetts. E. A. Back (September): Received on June 2 from Scituate with statement that an exceptionally high tide 1 day last August drove hundreds over the sea wall and onto our lawn and cement piazza. Also reported on August 15 infesting houses near Gloucester. (Det. by A. B. Gurney.)

AN EARTWIG (Doru lineare Esch.)

Alabama. E. A. Back (September): Forwarded from Robertsdale on August 17, where they were excessively abundant and driving trade from tourist camp by entering cottages and their furnishings. (Det. by A. B. Gurney.)

BROWN-BANDED ROACH (Supella supellectilium Serv.)

Indiana and Missouri. J. J. Davis (September 27): During the last month or 6 weeks, reports and specimens have been received from pest control operators at Columbus, Ind., and Cape Girardeau, Mo.

A CRICKET (Nemobius fasciatus Deg.)

New York. E. A. Back (September): Reported on August 18 by Public Health Department, Fort Plain, as very abundant and annoying to householders, often eating silk fabrics. (Det. by A. B. Gurney.)

MOTHS (Ephestia spp.)

District of Columbia. E. A. Back (September): Larvae and adults of E. cautella Walk. found in numbers on August 17 feeding on broken cotton seeds; perfect seeds unaffected. (Det. by C. Heinrich.) On August 16 a heavy infestation of E. kuehniella Zell. present throughout an old mill in Rock Creek Park.

NORTHERN MOLE CRICKET (Gryllotalpa hexadactyla Perty)

Indiana. E. A. Back (September): Reported on August 19 as in cellar of house in South Bend. (Det. by A. B. Gurney.)

SOUTHERN MOLE CRICKET (Scapteriscus acletus R. & H.)

Florida. E. A. Back (September): Captured in June at Daytona Beach at lights of store windows to which they had flown. (Det. by A. B. Gurney.)

A CERAMBYCID (Stromatium fulvum Villers)

New Jersey. E. A. Back (September): On ~~August~~ August 24 collected on furniture from which specimens were emerging about 1 year after construction. A European species, more or less cosmopolitan, it is not known to be established in the United States, according to W. S. Fisher. (Det. by W. S. Fisher.)

A FUNGUS BEETLE (Tymphaea fumata L.)

Minnesota. A. G. Ruggles and C. E. Mickel (September 13): Reported attacking grain in extreme abundance in two areas in southern Minnesota.

AN AMBROSIA BEETLE (Pterocyclon fasciatum Say)

Tennessee. G. M. Bentley (August 16): Reported as doing damage to mahogany wood at a large factory in Memphis. (Det. by M. W. Blackman.)

TREE LICE (Psocidae)

United States. E. A. Back (September): Psocids received from New York City on August 8, 9, 11, 13, 16, and 18, from apartment houses. Infestations general in most instances in recently completed and occupied buildings. Reports of abundance on August 18 in Brooklyn, N. Y., in new apartment house, just completed. On August 16 at Brooklyn abundant in an apartment built 1 year. On August 20 from Garrett Park, Md., specimens of Ectopsecus sp. received, of which A. E. Gurney, who made the determination, writes: "This is a species that we have received a number of times in quarantine from Mexico but further studies will be necessary to identify the species." Psocids on August 6 at Sophia, W. Va., very annoying in apartment house with walls of a veretable insulation board. Reported on July 15 in a new upholstered sofa at Georgetown, S. C. On August 27 at Cleveland, Ohio, troublesome in house painted during July, after period of 15 years of neglect; no psocids observed before painting. Reported in August in Barrington, Ill., as abundant inside and outside of newly built house. Reported on August 11 as unusually abundant in a house at Boise, Idaho. On August 11 reported as exceedingly abundant in house recently completed but unoccupied for several months before the nests were observed.

INSECT PEST SURVEY BULLETIN

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THE MORE IMPORTANT RECORDS FOR OCTOBER

Damage by grasshoppers is practically over for the season. They are disappearing rapidly. A swarm of Schistocerca americana Drury was observed late in the month moving from north-central Missouri into northeastern Missouri.

The fall armyworm occurred in large numbers in Mississippi, Kansas, and Virginia.

False wireworms were doing some damage to fall-planted wheat in Nebraska and Oklahoma.

The chinch bug was reported as being very abundant in the southeastern part of Iowa, and moderately abundant in Illinois and Indiana.

Late-season damage to corn by the corn ear worm was reported from Indiana to Minnesota and southward to Texas and Arizona; also a heavy infestation in sweet corn was reported from Washington State. Late tomatoes are generally infested in some of the late-tomato-growing sections in the South and also in California.

A single specimen of the European corn borer was found at Arlington, Va., this being about 80 miles from the nearest known infested area.

The corn lantern fly was collected at Columbus, Ohio, during the month, this being the first record for the State.

The vetch bruchid has been found to occur about 50 miles east of Portland in Oregon.

The San Jose scale seems to be generally more abundant than usual from the South Atlantic to the East Central States.

Moderate to heavy populations of the codling moth are reported from Maryland westward to Minnesota and Missouri. Heavy infestations are reported from Utah, and in Washington State the infestation is reported to be the heaviest in many years.

The peach borer is generally above normal in abundance in the South Atlantic and Mississippi Valley States.

Widespread and serious damage was done in the commercial grape-growing sections of Ohio by the grape berry moth this season.

A moderately heavy infestation of garden webworms in truck crops is reported from North Carolina, with severe damage by a species of Loxostege to sugar beet being grown for seed in Arizona.

Pea aphid is much more numerous this fall than it has been for several years in Wisconsin.

Rather severe injury to beans by the Mexican bean beetle is reported from North Carolina, Tennessee, Mississippi, and Arizona.

The pickle worm was observed considerably north of its normal range this year in Rhode Island.

Heavy populations of boll weevil are reported from South Carolina, Florida, Mississippi, Louisiana, and Texas.

A heavy infestation of the moth Heterocampa manteo Dblly. was observed in the Chippewa National Forest in northern Minnesota. The insect was defoliating birch, basswood, and oak.

A new outbreak of Douglas fir tussock moth is apparently started in the Blue Mountains of eastern Oregon, with a smaller infestation in the Malheur National Forest in southeastern Oregon. The last outbreak of this species occurred 10 years ago.

Western pine beetle shows an increase over the last 2 years in eastern Oregon and Washington and in the southern Sierras of California.

Very heavy infestation of Nantucket pine shoot moth was observed on the Island of Martha's Vineyard, Mass.

An intense infestation by the European spruce sawfly was observed in New Hampshire with concentrated infestations throughout Maine, Vermont, and eastern New York.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Ohio. E. J. McNerney (October 17): Large grasshoppers are arriving alive on running gear and plates of cars from the West and Southwest. First appearance noticed on October 2.
- Illinois. W. P. Flint (October 28): Although the weather late in September and October has been very favorable for the deposition of grasshopper eggs, there are only a few points in the State where eggs are more abundant than normal. These are scattered points in a number of central counties. None of the areas are large. Eggs were deposited in less than normal numbers in many of the northern and southern counties.
- Michigan. R. Hutson (October 22): Grasshopper survey records indicate that not only the infestation in the Upper Peninsula but also that in the upper part of the Lower Peninsula are lower than last year's. Melanoplus mexicanus Sauss. is the dominant species.
- Minnesota. A. G. Ruggles (October): Eggs reported in Carlton, Chicago, Dakota, Marshall, and Ottertail Counties. Egg survey not yet completed but some areas show plenty of eggs for next year's brood. Clear-winged grasshopper (Camnula pellucida Scudd.) moderately abundant in Douglas County.
- Missouri. L. Haseman (October 25): Scattering numbers continued active, apparently still laying eggs, throughout the first 3 weeks in October. The fall has been ideal for oviposition. Adults of the red-legged (M. femur-rubrum Deg.), the lesser migratory (M. mexicanus), the differential (M. differentialis Thos.), and the large American grasshopper (Schistocerca americana Drury) have been active until the last few cold days and nights. A swarm of the American grasshopper moving from the southeast into the northwest was reported in north-central Missouri, along the Iowa border, on October 17.
- Kansas. J. R. Horton (October 3): On July 22 migratory flights of hoppers were reported as observed on several days over Wichita, together with a material decrease in numbers in certain local fields. In September it became evident that a further extensive reduction had occurred in the number of grasshoppers in local fields. They have failed to do any serious damage to young wheat on land where they previously cut 100 percent of the plants to the ground. Egg deposition promises to be light in such places. The decrease in numbers was due to migration. Slight damage done to wheat, grasses, and corn.
- H. R. Bryson (October 25): Grasshoppers caused much less injury to fall-sown wheat than usual. In many localities they were scarce at the time wheat was germinating.
- Oklahoma. C. F. Stiles (October 25): Rapidly disappearing during the last month and the only place where they are doing any damage is in the Panhandle, where they are damaging fall-seeded wheat. The species doing the most damage is M. mexicanus in Texas County.

New Mexico. J. M. Landrum (October 23): An infestation of M. bivittatus Say with M. differentialis occurred in the central part of the Rio Grande irrigated valley from Belen, Valencia County, to 4 miles north of Albuquerque, Bernalillo County. They are attacking alfalfa, corn, truck crops, and ornamentals. Dissoteira longipennis Thos. has been spreading in a southern and southwestern direction for the last 3 years into Union, Harding, Colfax and Quay Counties, northeastern New Mexico. A second wave seems to be starting, as the same area covered in 1936 is again infested.

Arizona. C. D. Lebert (September 27): Several species of hoppers observed in garden plots, alfalfa fields, and fence rows in the Chino Valley, Yavapai County. Several alfalfa fields are infested with an average of 30 hoppers per square yard.

Utah. G. F. Knowlton (October 20): Recent cold nights appear to have reduced adult populations in Cache Valley, north-central Utah, approximately 40 per cent.

Oregon. D. C. Mote (October): Grasshopper oviposition in eastern Oregon is complete.

California. C. S. Morley (October 4): Still very numerous in Kern County. Doing practically no damage to agricultural crops.

 FALL ARMYWORM (Laphygma frugiperda S. & A.)

Virginia. H. G. Walker and L. D. Anderson (October 28): Causing considerable damage in late pea fields at Norfolk by eating out the developing flower buds. They are quite abundant in some fields of spinach.

Mississippi. C. Lyle (October 26): A heavy infestation of grasshoppers observed on September 27 near Marigold, Bolivar County. A light infestation on gladiol plants reported at Lyman, Harrison County, on October 15.

Kansas. R. W. Portman (October 5): Fall armyworms moved in on a wheatfield in Phillips County from pasture (grama and buffalo grass) to the east, and turned south, destroying 75 percent of the stand of wheat. Several fields in the county show more or less injury, although it is spotted in the fields and in the county.

 BEET WEBWORM (Loxostege sticticalis L.)

Arizona. O. L. Barnes (October 24): Full-grown larvae were quite numerous near Flagstaff, Coconino County, along weedy fence rows and roadsides on October 19-20. The insects were in hibernating cocoons within an inch or two of the soil surface, and thickest where there were regular stands of Russian-thistle. Populations ranged from 6 to 23 per square foot, averaging about 12 per square foot where counts were made. Larvae were seldom encountered in cultivated fields or in native grassland. There were extremely heavy infestations of the larvae and adults in the Flagstaff area during the summer. Considerable damage occurred in vegetable gardens, but most of the feeding was done on weeds, especially pigweed and Russian-thistle.

ARMYWORM (Cirphis unipuncta Haw.)

Vermont. J. V. Schaffner, Jr. (October 21): Moths reported as very abundant around the lights in Randolph during the middle of September.

Connecticut. J. V. Schaffner, Jr. (October 21): Moths brought in on October 17 and reported as abundant around lights in New Haven. Noted in abundance around lights in Hamden on October 19.

Virginia. F. F. Dicke (October): Common occurrence over northern Virginia areas has been reported. Found feeding on corn along with and in a manner similar to that of the corn ear worm. The injury was also common during August.

Missouri. L. Haseman (October 25): Since the middle of October a sprinkling of moths has been on the wing in central Missouri.

WIREWORMS (Elateridae)

Pennsylvania. C. A. Thomas (October 26): Although there has been some wireworm damage to potatoes in Pennsylvania during the last season, the injury has been scattered sparsely over the State and no bad outbreaks have been noted. The species injurious to truck crops in southeastern Pennsylvania was recently determined by M. W. Lane to be Linonius dubitans Lec. Previously we have referred to this species as L. agonus Say, which is apparently a much scarcer species here.

Tennessee. G. M. Bentley (September 26): Wireworms reported as seriously damaging sweetpotatoes in western Tennessee, making many of them unmarketable.

California. R. E. Campbell (October 10): About 2 acres in one corner of a large field of late fall potatoes were so heavily infested with wireworms that most of the plants were killed. Plants pulled up either had wireworms feeding in the underground stems and roots, or showed signs of feeding. These stems and roots were attacked much more than the partially grown potatoes present.

FALSE WIREWORMS (Eleodes spp.)

Nebraska. M. H. Swenk (October 21): The Plains false wireworm (E. opaca Say) reported on October 12 as damaging wheat in Harlan County.

Oklahoma. C. F. Stiles (October 25): False wireworms have been reported from Woodward County as seriously damaging fall-sown wheat, and in many fields the stands have been destroyed. The species doing the damage has not been determined.

WHITE GRUBS (Phyllophaga spp.)

Kentucky. W. A. Price (October 24): A heavy flight of Brood B adults is expected to occur in the Bluegrass Region in the spring of 1939. Weather and soil conditions were favorable for pupation and populations of from 40,000 to 60,000 adults per acre have been found in the vicinity of Lexington. P. hirticula Knoch is the most common species.

Michigan. R. Hutson (October 22): First-year white grubs were found rather numerous in grasshopper trampling operations in the northeastern counties of the Lower Peninsula, particularly in Gladwin, Alpena, and Montmorency Counties.

Kansas. H. R. Bryson (October 25): White grubs are abundant near the surface of the soil. Owing to high soil temperatures, they have been active at the roots of green plants and have caused some injury. One field of corn near Manhattan showed about 10 percent of the stalks down as a result of having had the roots eaten off during the latter part of the summer.

R. W. Portman (October 23): At Saint Francis, in southwestern Kansas, a wheatfield broken out of native sod in 1935 has been infested with white grubs. Although there had been no apparent injury until this fall, the grower had redrilled twice by October 15, with damage to the total acreage. Many fields in the vicinity show partial damage.

Nebraska. M. H. Srenk (October 21): White grubs reported as destroying wheat in Hamilton County on September 30. An inquiry as to control of white grubs in lawns received from Thurston County on September 26.

SCARABAEIDS (Ochrosidia spp.)

New Jersey. L. B. Parker (October 7): White grubs were found to be very abundant in lawn area of about 3/4 acre in one yard at Moorestown, Burlington County. Turf was seriously injured and, in many places, could be rolled back over areas of several square feet. No other infestation was found in the yard on either side of the one in question. Abundance was 20 to 25 per square foot. Workmen gathered approximately 5 quarts of grubs from an area of 60 square feet.

Kentucky. W. A. Price (October 24): A large lawn on a farm near Lexington was found to be severely injured by grubs of O. immaculata Oliv. late in September.

GREEN JUNE BEETLE (Cotinis nitida L.)

Kentucky. W. A. Price (October 24): Larvae are very abundant in the vicinity of Lexington.

FULLER'S ROSE BEETLE (Pantomorus godmani Crotch)

Florida. S. O. Hill (October 20): Specimens were attacking the foliage of tung-oil plant at Monticello, Jefferson County. Also observed attacking foliage of pecan, Cape-jasmine, and other plants. (Det. by L. L. Buchanan.)

COMMON RED SPIDER (Tetranychus telarius L.)

Pennsylvania. C. A. Thomas (October 26): The greenhouse red spider has caused much injury to various varieties of roses in the Kennett Square area during the last season. Several bad infestations in chrysanthemums, with extensive webbing of the leaves and flowers, have also been seen in this area.

CEREAL AND FORAGE CROP INSECTS

WHEAT AND OTHER SMALL GRAINS

HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (October 24): No serious infestation present, even in north-western Ohio, where in one county the insect fed upon 32 percent of the straws of the 1937 crop. The situation has been relieved, apparently through general observance of safe-sowing dates, aided to some extent by timely rains, which prevented seeding in that area during the week preceding the recommended dates.

Indiana. C. Benton (October 31): In the locality of La Fayette emergence was rather straggling between September 15 and October 10. Most of the emergence occurred the last week in September. Wheat sown prior to the safe date (September 28 for this locality) and up to October 1 shows moderate to severe infestation; wheat sown since the safe date shows light to no infestation. Wheat sown the middle of September showed many full-grown larvae by October 10 and some puparia by October 22. The unusually long, favorable weather has permitted many of the severely infested early sown fields to tiller out in an effort to overcome the infestation. In a stubble field near Delphi, 20 miles northeast of La Fayette, less than half of the flies emerged from the stubble, owing to lack of rain in this locality. A rain on October 11 caused a light emergence in late October, thus bringing about a light infestation of late-sown wheat.

Missouri. L. Haseman (October 25): A fall check-up on wheat stubble in the north-eastern counties of the State, which were not covered in the earlier Federal report, showed that most of the areas from which stubble was examined had no flaxseeds, while stubble from other fields showed very light infestation, averaging 2.2 percent.

Correction.—Data on hessian fly survey for Missouri and map illustrating same were represented incorrectly in the Insect Pest Survey Bulletin issued on September 20 (vol. 18, supplement to no. 7, p. 516). On the map, infestation in the northwestern part of the State should be 2 percent, in the south-western part 8 percent, in the southeastern part 1 percent, and in the east-central part 3 percent. The Hessian fly infestation, June 1938 figures given in the summary were for Oklahoma, instead of for Missouri. Correct summary follows.

Area	Fields		Stems infested		
	Sampled	Number	Average	Maximum	Minimum
			Percent	Percent	Percent
Missouri:	:	:	:	:	:
Northwestern -----	20	:	2	10	0
West-central -----	33	:	2	22	0
East-central -----	43	:	3	18	0
Southwestern -----	35	:	8	68	0
Southeastern -----	20	:	1	4	0

Kansas. J. R. Horton (October 3): The fall generation was unusually late in getting under way, first eggs occurring on September 22. Population promises to reach a new low level in local winter wheat seedings, partly as a result of abnormally hot, dry weather, although there were two good rains in the first half of September. Volunteer wheat occurring in favorable locations in July and August received only a trace of infestation, but volunteer did not appear generally until about September 19.

E. T. Jones (October): In a limited survey made on October 24 of 27 selected fields in 10 counties in eastern Kansas infestation was found in all but 3 fields. Average infestation was 14 percent; average intensity, two puparia per infested stem. Owing to poor stands of wheat, infestation is spotted. Infestations occur over a greater area than usual. No serious injury likely to occur this fall, but the increase in population constitutes a threat to the spring crop.

CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton (October 31): The unusually long, warm, dry fall permitted complete development of the second brood and migration of the brood to winter hibernation quarters. No serious general second-brood infestation reported this fall, although a few cornfields were heavily infested and somewhat damaged in spots. Most of the nymphs had reached the adult stage by October 1. Migration to winter quarters started the first of September, heavy migrations occurring late in September and early in October.

Illinois. W. P. Flint (October 23): The warm, dry weather late in September and in October has been very favorable for chinch bugs going into winter quarters. While the population was greatly reduced by the wet weather of the summer, the favorable fall has aided the insect to such an extent that there may be some damage in 1939.

Iowa. H. E. Jaques (October 25): Very abundant in the southeastern part of the State.

A LEAFHOPPER (Deltoccephalus inimicus Say)

Nebraska. M. H. Swenk (October 21): Specimens were sent in from Harlan County on September 27 with the report that it had damaged a large field of wheat.

EUROPEAN WHEAT STEM SAWFLY (Cephus pygmaeus L.)

Pennsylvania, Delaware, and Maryland. (October 20): A wheat-insect survey made by E. J. Udine and J. S. Pinckney during July and August, in which a 50-stem sample from each of 5 fields in each county was examined, yielded the following data on sawfly abundance. In Pennsylvania, in Berks, Bucks, Lancaster, Lebanon, and Lehigh Counties infestation was 4 percent; in Centre County, less than 1 percent. In Delaware less than 1 percent of stems were infested in New Castle County. In Maryland, in Baltimore and Carroll Counties there was a 3-percent infestation.

BLACK GRAIN STEM SAWFLY (Trachelus tabidus F.)

Pennsylvania, Delaware, Maryland and Virginia. C. C. Hill (October 20): The wheat-insect survey conducted by E. J. Udine and J. S. Pinckney yielded the following data on abundance of this sawfly: In Pennsylvania, in Franklin, Huntingdon, York, Centre, Butler, Indiana, and Mercer Counties less than 3 percent of the stems were infested. In Delaware 1 percent of the stems were infested in Kent and New Castle Counties. In Maryland, in Cecil, Dorchester, and Queen Anne's Counties, on the Eastern Shore, there was no infestation. In Baltimore, Carroll, Frederick, Montgomery, and Washington Counties there was a 3-percent infestation. In Virginia, in Fauquier, Prince William, Loudoun, Caroline, Essex, Hanover, Westmoreland, Augusta, Rockbridge, Rockingham, Shenandoah, Pittsylvania, Halifax, and Campbell Counties the infestation was less than 2 percent. The range was from 0 to 14 percent. Most southern localities where it was found were in Halifax and Campbell Counties.

CORN

CORN EAR WORM (Heliothis obsoleta F.)

Indiana. H. C. Mason (October 24): Infestation was light on corn and tomatoes the first part of the season around Vincennes, southwestern Indiana. Moths started to appear in numbers about August 17 and by early September the infestation was heavy in late-planted corn, but tomatoes escaped injury.

Kentucky. W. A. Price (October 24): Unusually scarce in tomatoes at Lexington, although abundant in sweet corn.

Minnesota. A. G. Ruggles and assistants (October): Some areas around Minneapolis and Saint Paul showed heavy infestation in late sweet corn.

Iowa. H. E. Jaques (October 25): Field corn considerably damaged although the pest seems to be somewhat less abundant than in its worst years.

Missouri. L. Haseman (October 25): Late sweet corn at Columbia was practically 100-percent infested.

Nebraska. R. W. Portman (October 23): From one to four larvae observed in Cheyenne County on October 15 in a compact sorghum head; not all heads of same strain attacked. Some compact heads seem to be resistant. Damage amounted to 10 percent in spots.

Texas. R. K. Fletcher (October 21): Usually severely injurious to grain sorghum, but not found on sorghum in Robertson, Limestone, Navarro, Ellis, and Dallas Counties in a recent survey.

Arizona. O. L. Barnes (October 24): Practically all ears examined in several corn-fields at Chino Valley, Yavapai County, from September 27 to 29 contained larvae. Damage to grain in individual ears ranged from very light to 10 and 15 percent, depending on the size and number of larvae present in each ear. Near Flagstaff, Coconino County, ears of corn were examined at random in four fields on October 19-20. All ears examined in three of the fields and

90 percent of those examined in the fourth field had been attacked. Living larvae were abundant in ears at Flagstaff on September 30, but no larvae were observed on October 19-20.

W. A. Stevenson (October 1): L. L. Stitt, of the Tempe station, reports that in the Yuma and Mohawk Valleys, Yuma County, considerable damage has been inflicted to seeding alfalfa in some fields. Moths reared from larvae collected in the alfalfa fields confirmed the identity of the species. So far as we are aware, this is the first authentic record of damage to alfalfa in Arizona by this common cotton insect.

Washington. W. W. Baker and C. W. Getzendaner (October 15): Nearly every ear of sweet corn in late pickings at Puyallup was infested. Reported also as infesting popcorn near Graham. Both localities are in Pierce County.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Connecticut. M. P. Zappe (October 24): The hurricane of September 21 blew down a large number of apples at the Experiment Station orchard. Some varieties were on the ground for about 2 weeks and during that period about 5 percent of them under certain trees became infested with corn borers. There was no corn near these trees but weeds were present in the hedge row adjoining the orchard.

Virginia. C. M. Packard (October 24): On October 14 a single larva was found by F. F. Dicke in the corn experimental plot at Arlington Farm. As the airline distance to the nearest previously known infestation, Delaware and the Eastern Shore, is about 80 miles, there seems reason to suspect that additional nearby areas of infestation may exist in Virginia and Maryland. (Det. by C. Heinrich.)

Guam. R. G. Oakley (August 31): Average infestation of corn during the periods of heavy corn planting, maturing normally in June and July and in December and January, as found in 51 fields scattered about the island for three crop seasons, the third ending in July 1938, was estimated at 4 percent. The heaviest infestations found in these three periods amounted to only 7 percent whereas some fields scouted gave negative findings. The average parasitization by Lydella stabulans Meig. var. amounted to 90 percent. The average infestations in scattering fields maturing several weeks later than the normal crop were found to increase. Two such fields in September 1937 bore 20- and 26-percent infestations, respectively, but with 95 percent parasitization. In August 1938 two fields bore 50- and 70-percent infestations, respectively, of the borer. Parasitization by L. stabulans in these cases amounted to about 98 percent. Damage by the borer in all but the two last-mentioned fields appeared to be of little importance. Three borers per stalk were rarely found in an infested stalk, two borers per infested stalk were not common, except in the heavier infestations, and one borer per stalk did not appear to materially affect the size of the ear.

CLOVER HAY WORM (Hypsopygia costalis F.)

Louisiana. W. E. Anderson (October 21): Reported as doing considerable damage, especially in corn fodder.

PINK CORN WORM (Pyroderces rileyi Wlsm.)

South Carolina. O. L. Cartwright (October): Found in at least 75 percent of the ears in field corn in the coastal half of the State.

CORN LANTERN FLY (Peregrinus maidis Ashm.)

Ohio. H. Osborn (October 9): Observed on the University campus at Columbus on October 7. This is my first record for Ohio and, so far as I am aware, no records for the species have been made north of Tennessee for the Mississippi Valley. Specimens were taken in numbers and apparently the species is well established for the season, but whether it will survive at this latitude is a question. It is a common southern species and is reported as far north as Washington along the Atlantic seaboard.

A BROAD-NOSED GRAIN WEEVIL (Caulophilus latinasus Say)

South Carolina. O. L. Cartwright (October 4): Found in 39 percent of the ears of corn in a field near McClellanville, Charleston County. It was found in lesser numbers in other fields in Charleston, Georgetown, and Horry Counties.

A FLOUR BEETLE (Cathartus cassiae Reiche)

South Carolina. O. L. Cartwright (October): Found in 75 percent of the ears of field corn in the coastal half of the State.

A SCARABAEID (Holotrichia mindanaona Brenske)

Hawaii. R. G. Oakley (August 30): Grub-population counts were made in one field to determine the average number of grubs present per square foot. The field chosen for the purpose, typical of the grub-infested district at Dededo, was adjacent to forest growth on one side, to coconut plantings on the opposite side and ends, and had a few coconut palms interplanted in the field. In sites examined the populations were found to range from less than one to five grubs per square foot, averaging 2.53 grubs of mature size per square foot. Grubs were reduced by 61 percent in a 19-day period by cultivation, hand-picking, and ranging of chickens. Light trap results: The two light traps located at Piti and Asan were operated continuously at night during August, with a total catch of three beetles, two of which were caught on the last day of the month.

ALFALFA

THREE-CORNERED ALFALFA HOPPER (Stictocephala festina Say)

South Carolina. W. C. Nettles (October 24): Pest apparently caused serious damage to alfalfa at Rock Hill, York County.

ALFALFA CATERPILLAR (Eurymus eurythene Bdv.)

Nevada. G. G. Schweis (October 19): A serious outbreak observed in Churchill County and, to a lesser extent, in Pershing County, both in western Nevada.

SORGHUM WEBWORM (Celama sorghiella Riley)

Texas. R. K. Fletcher (October 21): Found to be present on grain sorghums in Robertson, Limestone, Navarro, Ellis, and Dallas Counties in greatly reduced numbers.

VETCH

VETCH BRUCHID (Bruchus brachialis Fahraeus)

Oregon. L. P. Rockwood (October 15): In examining a lot of insects swept on roadsides and fence rows at Parkdale, Hood River County, on May 28, 1938, almost immediately some B. brachialis were found. It was reported that there were from 15 to 20 of the weevils in this collection from fence row--apparently they must have been rather thick. This locality is 50-60 miles east of Portland and mostly in the Cascade Range. All lots of seed seen or recorded in the Willamette Valley have been very lightly infested, mostly under 1 percent.

CLOVER

CLOVER SEED CHALCID (Bruchophaeus gibbus Boh.)

Michigan. R. Hutson (October 22): Reported from Sandusky, Sanilac County.

CLOVER SEED MIDGE (Dasynoura leguminicola Lint.)

Michigan. R. Hutson (October 22): Reported from Sandusky, Sanilac County.

COWPEAS

LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

North Carolina. W. A. Thomas (October 19): This insect has been particularly abundant at Chadbourn, Columbus County, on some fields of cowpeas during the last month. The attack has been so severe as to cause the small peas to die before reaching maturity, while other pods have been deformed to such extent that their market value has been destroyed.

VELVETBEANS

VELVETBEAN CATERPILLAR (Anticarsia gemmatilis Hbn.)

South Carolina. W. C. Nettles (October 24): Reported from Colleton County in September.

J. G. Watts (September 27): Injury noticeable but not very serious at Garnet, Hampton County. In the State as a whole very little damage has been done.

Louisiana. L. O. Ellisor (October 22): During the last month infestation has been wiped out by the fungus Spicaria prasina.

FRUIT INSECTS

SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

- Maryland. E. N. Cory (October 22): There has been an unusual build-up of this scale on apple throughout the State.
- Georgia. O. I. Snapp (October 20): Conditions during the last month have been unusually favorable for the San Jose scale at Fort Valley, central Georgia, and the insect has increased so rapidly that the infestation is considerably greater than that of an average year. Some peach orchards are now encrusted with scale, although the trees have not yet entirely lost their leaves.
- Mississippi. C. Lyle (October 26): Considerable damage to peach trees in Hinds and Scott Counties, injury to peach and pear trees in southwestern Mississippi, and heavy infestations on peach and rose.
- Ohio. G. A. Runner (September 28): Large numbers of apples marked by scale in some orchards in the Sandusky area. An increase over last year.
- Illinois. W. P. Flint (October 28): The late broods will aid greatly in bringing up the infestation.
- Kentucky. W. A. Price (October 24): Unusually abundant this year in many Paducah and Henderson orchards. Very young scales are present.
- Arizona. C. D. Lebert (September 27): A light infestation found in a 3-acre apple and pear orchard near Cottonwood, Verde Valley, Yavapai County, during September.

A LEAF-CUTTING ANT (Atta sp.)

- Texas. R. K. Fletcher (October 21): Reported as injurious to orchards in Parker and Real Counties.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

- Ohio. G. A. Runner (September 28): Evidence of foliage injury in a few apple orchards, but has not been especially abundant this season in the Sandusky area.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

- Maryland. E. N. Cory (October 22): Recent survey shows a heavy population over the State, owing to a small crop of apples.
- Ohio. T. H. Parks (October 24): A check-up of 78 commercial orchards located in representative fruit sections showed both scab and codling moth to have increased slightly since 1937. The percentage of fruit blemished by codling moth, including both stings and entrances, was 6.2. It ranged from 0.3 to 54.0 percent, the highest infested orchards being in Lucas County, near

Toledo. The increase in percentage of blemished fruit over that of a year ago is obviously owing to a very light crop and to the fact that much spot spraying was done.

Minnesota. A. G. Ruggles (October 25): Unsprayed orchards showed a heavy infestation.

Missouri. L. Haseman (October 25): Recent counts of overwintering larvae under tree bands indicate that many of the larvae reached maturity before late apples were removed from the orchard; therefore we are going into the winter with many apple worms.

Utah. C. J. Sorenson (October 21): More larvae will overwinter in Utah County than during the last two seasons.

Washington. E. J. Newcomer and M. A. Yothers (October 18): Hot weather, which lasted from September 10 to 27, has caused an unusual amount of late worm infestation. Fruit shippers claim that in this respect it is the worst season they have ever experienced, and the Weather Bureau records show that it was the warmest September in 30 years. Pupation practically ceased by August 20. Of 1,200 larvae entering bands from August 23 to 30, only 3 or 4 pupated.

APHIDS (Aphidae)

Maine. F. H. Lathrop (October 19): Late in the summer in Monmouth, Kennebec County, the apple aphid (Aphis pomi DeG.) became very scarce and colonies difficult to find on apple trees. On experimental trees a light infestation continued. First eggs were noticed on these trees the last week in September and are still being deposited.

Kentucky. W. A. Price (October 24): Apple orchards at Lexington are heavily infested with the fall migrants of the rosy apple aphid (Anuraphis roseus Baker). Oviparous females are being produced in considerable numbers.

WHITE APPLE LEAFHOPPER (Typhlocyba pomaria McAtee)

Maine. F. H. Lathrop (October 19): Since the frosty nights that occurred early in October, the adults have been depositing eggs in apple bark at Monmouth. The adults are noticeably less numerous since the hurricane of September 21.

Connecticut. P. Garman (October 1): Apparently many adults were destroyed by the hurricane of September 21. Few could be found around New Haven after the storm.

A MEALYBUG (Pseudococcus comstockii Kuw.)

South Carolina. J. A. Berly (October 2): About eight trees at Clemson rather heavily infested, mostly on the main trunk, but scattered on smaller limbs also. (Det. tentatively by H. S. McConnell.)

APPLE MAGGOT (Rhagoletis pomonella Walsh)

Rhode Island. A. E. Stene (October 26): Unusually abundant this summer, even in well-cared-for orchards, making it difficult for farmers to dispose of windfalls after the storm.

Maryland. E. N. Cory (October 22): Infestation found in two poorly cared for apple orchards at Hancock, western Maryland.

Michigan. R. Hutson (October 22): Infestations reported from home apple orchards at Grand Rapids, Bay City, Saginaw, South Haven, and Portland.

PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

New Jersey. H. W. Allen (October 25): In Burlington County, on midseason varieties of peach, infestation of ripe fruit in 8 orchards ranged from 3.7 percent, or an estimated 8 fruits per tree, to 31.0 percent, or an estimated 117 fruits per tree. The average was 14.3 percent, with 52 infested fruits per tree. The infestation ranged from very light in some orchards to moderately heavy in others. In general, larval parasitization in twigs was lightest in orchards having a heavy fruit infestation.

Ohio. G. A. Runner (September 28): Less than the usual damage to the later ripening varieties of peaches in the Sandusky area.

Mississippi. C. Lyle (October 26): Considerable injury to young peach trees recently reported at Brookhaven, Grenada, and Jackson, in Lincoln, Grenada, and Hinds Counties, respectively.

PEACH BORER (Conopia exitiosa Say)

Georgia. O. I. Snapp (October 20): Dry weather during the egg-hatching season at Fort Valley facilitated the entrance of newly hatched larvae into the trees, resulting in an infestation somewhat heavier than usual, as revealed by the examination of many peach trees for borers during the last 2 weeks.

Mississippi. C. Lyle (October 26): Reported as moderately abundant in orchards near Senatobia and Jackson, in Tate and Hinds Counties, respectively. Data on control requested from various sections of the State.

Ohio. T. H. Parks (October 24): Larvae were already well developed by October 15, when they were found to be from one-fourth to one-half grown. This insect continues to be a problem in all peach orchards and is annually responsible for the death of many backyard peach trees.

Kentucky. W. A. Price (October 24): Borers are abundant. At Lexington as many as 21 borers, most of them large, were removed from a single 1-year-old peach tree.

BLACKBERRY

RASPBERRY ROOT BORER (Bembecia marginata Harr.)

Washington. W. W. Baker and B. J. Landis (October 19): Approximately 66 percent of the eggs have hatched, and 75 percent of the egg parasite Telenomus sp. have emerged on bush blackberries at Sumner, Pierce County.

ROSE LEAFHOPPER (Typhlocyba rosae L.)

Washington. W. W. Baker (October 14): Adults were moderately abundant on evergreen blackberries in Puyallup, Pierce County.

APHIDS (Macrosiphum spp.)

Washington. W. W. Baker (October 17): Rather common, and oviparous forms present on Rubus in Puyallup, Pierce County. Amphorophora rubi Kltb. also present.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

Kansas. J. R. Horton (October 26): Abundant on ornamental ivy during August and September at Wichita, causing much discoloration of the leaves and some defoliation by killing the leaves. Late in October adults have been extremely numerous about houses having such vines, and have caused annoyance by hovering about the doors and flying into the houses.

California. C. S. Morley (October 4): Very light as compared to this season last year in Kern County.

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

Ohio. T. H. Parks (October 24): Widespread and serious damage done to the commercial grape crop over most of northern Ohio. Losses in Ashtabula and Lake Counties, northeastern Ohio, were revealed to be serious in vineyards on clay land and located in communities that had never before experienced losses from this insect. In some vineyards where the crop was light the grapes were scarcely worth picking.

G. A. Runner (September 28): Loss of grapes in the Sandusky area due to the late brood, was serious in some vineyards, especially those bearing only a partial crop of fruit. An unusual feature of the seasonal development of the berry moth in this locality was the emergence early in September of moths from cocoons of the second brood from insectary material.

RAISIN MOTH (Ephestia figulilella Greg.)

California. P. Simmons and associates (September 30): Extensive and severe damage to several varieties of grapes was observed in Tulare County. The raisin moth appeared to be the primary pest, followed by Drosophila sp. Bunches of grapes were decomposed. Losses of this type are more severe than in any previous season.

GRAPE PHYLLOXERA (Phylloxera vitifoliae Fitch)

North Carolina. D. L. Wray (September 30): Severe damage to a vineyard at Tryon, Polk County, was observed in September.

PECAN

TWIG GIRDLER (Oncideres cingulatus Say)

North Carolina. W. A. Thomas (October 15): Particularly destructive in pecan groves in the Chadbourn area. Many branches in these trees have been severed and left lodged among the limbs, giving the trees a very ragged appearance. The insects are much more numerous this season than last. Also observed on hickory and persimmon.

Florida. H. Spencer (October 15): Some damage done to small Japanese persimmon trees. Also taken on Casuarina (Australian pine).

Mississippi. C. Lyle (October 26): Slight damage to pecan trees in Hinds and Madison Counties recently reported.

PECAN WEEVIL (Curculio caryae Horn)

Texas. W. C. Pierce (October 27): Pecan nuts produced on seedling and topworked pecan trees growing near Pecan Bayou, near Brownwood, are heavily infested. Many larvae were emerging from infested nuts during the latter half of October.

HICKORY SHUCK WORM (Laspeyresia caryana Fitch).

Ohio. G. A. Runner (September 28): Hickory nuts in all parts of the Sandusky area observed show heavy infestation.

South Carolina. J. G. Watts (October): Has caused more damage this season than for many years. Damage has been very general wherever pecans are grown.

Mississippi. C. Lyle (October 26): Specimens on pecan received from Bolivar and Washington Counties. Slight injury was reported in each case, and some injury to pecan was noted in southwestern Mississippi.

Texas. C. B. Nickels and W. C. Pierce (October 27): Shucks of pecan nuts produced in the vicinity of Brownwood are heavily infested. Infestation is very light at Crystal City.

RED-HUMPED CATERPILLAR (Schizura concinna S. & A.)

Florida. H. Spencer (October 20): Adults bred from larvae, found defoliating a young pecan tree on August 28, have been identified as this species. (Det. by J. F. G. Clarke.)

BLACK PECAN APHID (Melanocallis caryaefoliae Davis)

Mississippi. M. L. Grimes (October 26): Several heavy infestations on pecan were observed in the vicinity of Meridian during the month.

CITRUS

FLORIDA RED SCALE (Chrysomphalus aonidum L.)

Florida. H. Spencer (October 20): Present in all citrus sections. Leaf drop from heavy infestations has been seen in some groves and citrus nurseries. There were large increases in population late in the summer.

PURPLE SCALE (Lepidosaphes beckii Newm.)

Florida. H. Spencer (October 20): Scattered heavy infestations in all citrus sections, especially where the groves have received control measures that left inert residues.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. H. Spencer (October 15): Rust mites again increasing in numbers all over the citrus section, after the usual summer slump.

MANGO

RED-BANDED THRIPS (Selenothrips rubrocinctus Giard)

Florida. H. Spencer (October 10): Quite destructive to nursery mango trees in central Florida.

PAPAYA

PAPAYA FRUITFLY (Toxotrypana curvicauda Gerst.)

Florida. H. Spencer (October 1): After an absence of nearly 4 years, the papaya fruitfly is again observed in central Florida. It was eliminated from this section by the freeze of 1934, which cut down all the plants. Weather in the Miami district was not cold enough to eradicate it there.

A WHITEFLY (Trialeurodes variabilis Quaint.)

Florida. H. Spencer (October 20): Absent all this year from some plantings of papaya in central Florida. In other plantings, where the leaves remained green throughout last winter, this insect has been quite troublesome.

Correction.---The insect referred to as Papilio thoas L. in Insect Pest Survey Bulletin dated September 1, 1938 (vol. 18, No. 7, p. 471, last line) should have been P. cressphontes Cram.

TRUCK CROP INSECTS

GARDEN WEBWORM (Loxostege similalis Guen.)

North Carolina. Z. P. Metcalf (October 3): Doing serious damage to turnips in Granville County, north-central part of the State.

W. A. Thomas (September 26): A light infestation on the experimental cabbage plots at Chadbourn, Columbus County. An infestation of this insect has not been observed at Chadbourn during the last 3 years.

Arizona. O. A. Hills (October 11): Damage to sugar beets grown for seed was general over the Salt River Valley, but more severe in spots, and resulted in either spraying or dusting of approximately one-quarter of the acreage. The insect feeds primarily on the crown of the beet and in some fields damage was sufficient to cause barren spots. Principal damage occurred between September 15 and October 10. (Det. tentatively by K. B. McKinney as L. similalis, as was material formerly submitted.)

STRAWBERRY FRUITWORM (Cnephasia longana Haw.)

Oregon. D. C. Mote (October): First-instar larvae observed in the Willamette Valley in overwintering hibernacula. Injury has been severe to strawberries and flax during 1938, also considerable injury to sugar beets and legumes.

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

Rhode Island. A. E. Stene (October 26): Late brood reported as being abundant and attacking the surface of squash fruit at Kingston.

Missouri. L. Haseman (October 25): Feeding on late cucurbits throughout the first half of October, although in gardens under observation at Columbia, there were 10 spotted cucumber beetles to 1 striped beetle feeding during October. On October 26 there were two striped to one spotted cucumber beetle on squash.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Virginia. F. W. Poos (October 10): Especially abundant in peanut pods at Arlington Farm at the time of digging, on October 10.

Mississippi. N. L. Douglass (October 26): Very common in most gardens in the vicinity of Grenada, Grenada County.

Missouri. L. Haseman (October 25): Continued actively feeding on late cucurbits throughout the first half of October. At Columbia late Hubbard squashes and practically all of their bloom were consumed by swarms of these beetles. Since October 20 they have apparently all hibernated.

Nebraska. M. H. Swenk (October 21): Specimens sent in from Nuckolls County on October 16 with the report that they were attacking petunia, fall iris, and other ornamental plants.

FALSE CHINCH BUG (Nysius ericae Schill.)

Mississippi. M. L. Grimes (October 26): Injury to turnips recently observed in the vicinity of Meridian, Lauderdale County.

GREEN STINKBUG (Acrosternum hilaris Say)

Alabama. J. M. Robinson (October 22): On beans at Auburn on October 20.

POTATO AND TOMATO

CORN EAR WORM (Heliothis obsoleta F.)

Virginia. H. G. Walker and L. D. Anderson (October 28): More abundant and caused more damage to fall snap beans than they have for several years at Norfolk.

Ohio. T. H. Parks (October 24): Considerable injury occurred early in October to shipped tomatoes. A dealer at Cincinnati reported injury developing commonly after the fruits were placed in the ripening chambers.

N. F. Howard (October 24): On October 22 a heavy infestation was serious, damaging tomatoes in one of the Ohio State University horticultural green-houses at Columbus. The worms were feeding on fruits and foliage but the most severe injury was caused by the tunneling of larvae in the stems toward the tips, causing damage, which at first glance one would attribute to the work of the stalk borer.

Kansas. H. R. Bryson (October 28): Caused some injury to late tomato plants during the latter part of September. All of the larvae had pupated by October 25.

Utah. G. F. Knowlton (October 5): Very few tomato fruitworm moths have come to trap lights in Utah during 1938. A moderate increase in fruitworm injury to tomatoes has been reported by several northern Utah farmers, and this conforms to field observations.

California. A. E. Michelbacher (October 20): Over most of the tomato-producing area of northern California an infestation failed to develop. Tomato fields in San Joaquin County were surveyed on September 27 and the amount of fruit infested was, in general, less than 2 percent. The highest infestation was 3 percent. A number of fields observed in Sacramento County on October 13 showed only about 1 percent of the fruit infested. Infestation in Yolo County on October 14 ranged from 0 to 22 percent, the infestation in most fields being 3 percent or more. In several fields it ran between 6 and 8 percent, and only in a single field was a 22-percent infestation encountered. Infestation at Brentwood, Contra Costa County, is extremely light. At Piesanton, Alameda County, infestation in undusted fields averaged about 2 percent. No fruits were found infested in tomato fields around Madera, Madera County, on October 6. According to a survey on October 26, only a very small amount of fruit was found infested in Merced County. The infested fruit in the different fields ranged from 0 to 3.5 percent. Fruit infested in different fields in Alameda County ranged from 1.0 to 9.5 percent. In a survey of tomato fields in

Stanislaus County made on October 28 the amount of fruit infested for the different fields ranged from less than 1 percent to 16.5 percent. Average infestation was close to 3.5 percent. The field with 16.5-percent infestation was on the western side of the county, where a large acreage of beans is grown, leading to the belief that a large population of moths built up on the bean crop, moving over to the tomatoes after the beans had matured.

J. C. Elmore (September 26): Damaging bean pods at Yorba Linda, Orange County.

TOMATO PINWORM (*Gnorimoschoma lycopersicella* Busck)

Pennsylvania. C. A. Thomas (October 26): Careful examination of greenhouses and gardens in the Chester County and New Castle areas during the spring and summer of 1938 have failed to show a single specimen of any stage of the pinworm. Crop rotation, omitting the fall tomato crop and substituting a flower crop, has had the desired effect of starving the pinworm out.

California. A. E. Michelbacher (October 20): Infestation in tomato fields around Madera, Madera County, on October 6 ranged from 17 to 67 percent. Because harvest had been completed from 4 to 6 weeks the infestation was causing no serious loss. It was stated by the growers that the infestation was very light at the time harvest was finished. (October 25): Pinworm survey made in Merced County on October 24. Most of fields had been plowed under after harvest. In fields where tomatoes had not been plowed under infestation of fruit ranged from 7.5 to 26.0 percent. Infestation in most fields was close to 25 percent. In one 90-acre planting two rows of tomatoes on either bank of an irrigation ditch had not been plowed under. Foliage was severely injured and 91.5 percent of the fruit was infested. When this field was surveyed late in July no evidence of pinworm was found. First pinworm taken in the county was on July 18 and infestation was extremely light, at least during August. (October 29): In 3,200 fruits picked and examined in a survey on October 28 of tomato fields in Stanislaus County, 1 was found infested with larvae.

J. C. Elmore (October 19): Infestations have been from 5 to 10 percent of the fruits in most of the lowland areas along the coast in the southern part of the State. In highland areas of almost continuous tomato growing, infestations of the fruits have run from 22 to 76 percent in untreated plots.

POTATO TUBER MOTH (*Gnorimoschoma operculella* Zell.)

California. A. E. Michelbacher (October 20): On September 27 in San Joaquin County a single tomato was found infested with three larvae. On October 14 in Yolo County a single tomato was found infested with a larva. This marks the first time a tomato has been observed to be infested with potato tuber moth larva in Yolo County. Infestation at Pleasanton, Alameda County, averaged less than 1 percent. (October 27): In a survey of tomato fields in Alameda County on October 26 the amount of fruit infested by larvae ranged from 0 to 6.25 percent. (October 29): In a total of 3,200 fruits picked and examined in a survey on October 28 of tomato fields in Stanislaus County, 2 were found infested with larvae.

A. F. Howland (September 6): Found at Huntington Beach, Orange County, causing damage to tomato fruit in a district where seldom more than a trace of this insect is found on tomatoes. In a 4-acre field 7.8 percent of the fruit on 25 plants was found to be infested. A total of 653 fruits were examined and 51 were found to be infested.

HORNWORMS (Protoparce spp.)

California. A. E. Michelbacher (October 20): On September 27 in San Joaquin County hornworm damage of a serious nature was observed in only a few tomato fields. A number of tomato fields in Sacramento County, surveyed on October 13, showed little evidence of serious hornworm damage. Hornworms did some rather serious damage to potato vines at Madera, Madera County, observed on September 26, when the infestation was found to be rather heavy. Apparently the infestation on potatoes resulted from a build-up of a large population of moths on datura, which was very abundant throughout the summer. (October 20) Hornworms were found to have caused considerable damage in a number of tomato fields surveyed in Stanislaus County on October 28.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

North Carolina. W. A. Thomas (October 7): Still very abundant on late beans, cowpeas, and soybeans at Chadbourn. On the late snap beans it has been necessary to resort to control measures in order to protect the crop. Usually in this area the bean beetle injury is practically over at this period of the year, but the infestation persisted throughout the summer and fall, necessitating frequent control measures during the entire season.

Tennessee. G. M. Bentley (October 28): Reported on October 26 as present in large numbers on garden beans at Bearden, Knox County.

Mississippi. C. Lyle (October 26): Reported on October 20 as having destroyed a great many plantings of beans in the northern part of Yalobusha County during recent weeks. Injury continued heavy on late plantings of beans in the vicinity of Meridian. Heavy damage to beans in Marshall County reported on October 5.

Arizona. C. D. Lebert (September 27): The entire planting of pole beans near Cottonwood, Verde Valley, Yavapai County, is practically gone, owing to the bean beetle. Adults and larvae present. Every vine almost completely skeletonized.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Maryland. E. N. Cory (October 3): Present on beans in Princess Anne, Somerset County.

North Carolina. W. A. Thomas (October 12): Still causing appreciable damage, especially to late beans at Chadbourn. It is also present in injurious numbers on fields of late cowpeas and soybeans.

BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

Alabama. J. M. Robinson (October 22): Found on beans and other vegetables at Auburn on October 10.

California. J. C. Elmore (September 26): Observed damaging pole beans at Yorba Linda, Orange County. From 5 to 10 adults were counted per vine.

BEAN LEAF ROLLER (Goniurus proteus L.)

Louisiana. L. O. Ellisor (October 22): Damaging the garden beans at Baton Rouge.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

Mississippi. C. Lylé (October 26): Specimens were sent in on October 20, with a report that 75 percent of the beans in an 8-acre field at Overt, Jones County, had been damaged.

GREEN CLOVER WORM (Plathypena scabra F.)

Alabama. F. S. Arant (October 17): Reared from larvae that were doing considerable damage to string beans and lima beans at Auburn. (Det. by J. F. G. Clarke.)

PEAS

PEA APHID (Illinoia pisi Kltb.)

Maine. J. H. Hawkins (September 24): Present in clover planted with late canning peas at Exeter, Penobscot County. Clover in early and midseason canning peas on the same farm not heavily infested.

Virginia. H. G. Walker and L. D. Anderson (October 23): Rather heavily infesting late peas at Norfolk.

Wisconsin. J. E. Dudley, Jr. (October 20): Much more numerous on alfalfa in Dane County, than for several years. On October 20 the average was from 150 to 200 aphids per sweep. A small percentage of oviparous females, from 1 to 2 percent. No males found as yet. Unusually warm weather and alfalfa in good condition, probably the cause.

Utah. G. F. Knowlton (October 14): More abundant on alfalfa than during the hot summer weather. Males, oviparous females, and eggs now being found in some northern localities.

CABBAGE

IMPORTED CABBAGE WORM (Pieris rapae L.)

Connecticut. N. Turner (October 22): Late cabbage and cauliflower show moderate to serious infestation. In Litchfield County few late cabbage growers dusted and there was no serious loss. Larvae more abundant in the Connecticut River Valley.

Virginia. H. G. Walker and L. D. Anderson (October 28): Although butterflies have been rather abundant in cabbage and collard fields this fall, very little damage has been caused by this insect at Norfolk.

Louisiana. C. O. Eddy (October 22): Butterflies have been flying abundantly during the last 10 days.

Nevada. G. G. Schweis (October 19): Untreated cabbage severely damaged by cabbage butterfly larvae.

California. R. E. Campbell (October 20): Present in practically all fall and winter cauliflower fields in Los Angeles County in sufficient numbers to require control measures.

CABBAGE LOOPER (Autographa brassicae Riley)

Virginia. H. G. Walker and L. D. Anderson (October 28): Since a disease killed most of the loopers that appeared late in the summer, this insect has been quite scarce at Norfolk.

A CABBAGE WORM (Evergestis straminealis Hbn.)

Connecticut. N. Turner (October 21): Several infested heads of Chinese cabbage in one small planting.

CABBAGE WEBWORM (Hellula undalis F.)

North Carolina. W. A. Thomas (October 10): Larvae still fairly abundant in fields of turnip and cabbage in the Chadbourne area. The peak of injury is past and there is a gradual decline in the number of adults observed.

South Carolina. W. C. Nettles (October 24): Less abundant than usual.

Mississippi. C. Lyle (October 26): Specimens sent in on September 30 with the report that a 4-acre field of cabbage in Forrest County had been destroyed by them. Considerable damage to cabbage also reported on October 6 in Copiah County.

CABBAGE APHID (Brevicoryne brassicae L.)

Connecticut. N. Turner (October 22): Locally abundant, about 5 percent damage in one 5-acre field.

Virginia. H. G. Walker and L. D. Anderson (October 28): A few cabbage plants at Norfolk rather heavily infested but not over 10 percent of the plants in any field examined have been infested with this pest.

Nevada. G. G. Schweis (October 19): Cabbage plants greatly stunted by aphids.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. H. G. Walker and L. D. Anderson (October 28): Rather abundant and causing considerable damage in one cabbage field at Norfolk. However, this is the only field observed where they have been abundant enough to cause injury.

South Carolina. J. G. Watts (October 27): Half-grown nymphs were observed in small numbers on soybeans at Blackville, Barnwell County.

W. C. Nettles (October 24): Occasional complaints of this pest have been received.

Mississippi. C. Lyle (October 26): Considerable damage to collards in southwestern Mississippi reported. Collards and other garden plants reported as injured in various parts of the State.

ONION THRIPS (Thrips tabaci Lind.)

Connecticut. N. Turner (October 22): Nearly all cabbage fields show moderate thrips damage on outer leaves.

SQUASH

SQUASH BORER (Melittia satyriniformis Hbn.)

Louisiana. C. O. Eddy (October 22): Abundant in squash and pumpkin.

MELONS

PICKLEWORM (Diaphania nitidalis Stoll)

Rhode Island. A. E. Stene (October 26): Early in September summer squash were brought in from Narragansett infested with this borer which, so far as known, has not been previously sent in. Some of the borers were reared and the identification was confirmed by workers from the National Museum.

South Carolina. W. C. Nettles (October 24): Occasional complaints received concerning this pest.

Louisiana. C. O. Eddy (October 22): Abundant in cucumbers during the last month.

Missouri. L. Haseman (October 25): An occasional worm was found feeding in late blossoms as late as October 15 at Columbia. Late worms during October seemed to prefer the blossoms to the squashes.

MELON APHID (Aphis gossypii Glov.)

Minnesota. A. G. Rugales (October 25): Very abundant this year, causing considerable damage.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Connecticut. N. Turner (October 22): Not very abundant, at least 50 percent parasitization, in one field in Cheshire, New Haven County.

Virginia. H. G. Walker and L. D. Anderson (October 28): Some fields of greens are rather heavily infested.

Tennessee. L. B. Scott (October 21): Moderately abundant in the north-central part of the State, doing little damage. The infestation is severe on some of the older plantings.

KALE

GREEN PEACH APHID (Myzus persicae Sulz.)

Virginia. H. G. Walker and L. D. Anderson (October 28): The lower leaves of kale plants in some fields at Norfolk are moderately infested; however, a great many of the aphids are being killed by a fungus disease and do not seem to be causing much injury to the plants.

STRAWBERRY

A LEAF ROLLER (Anacamptis fragariella Busck)

Oregon. D. C. Mote (October): Observed in the overwintering egg stage in the Willamette Valley. One generation per year is usual, and injury was light during the 1938 season.

STRAWBERRY CROWN MOTH (Conopia hibionipennis Bdv.)

Oregon. D. C. Mote (October): Observed in normal abundance in the Willamette Valley, where the insects are entering winter cells.

CURLED ROSE SAWFLY (Emphytus cinctipes Nort.)

Washington. W. W. Baker and B. J. Landis (October 19): Larvae are more abundant than usual on Marshall strawberries at Sumner, Pierce County.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

California. J. C. Elmore (October 19): An average of 76 percent of the pods in untreated experimental plots in Los Angeles and Orange Counties was infested by the end of August. By September 15 this resulted in an 80 to 86-percent pod reduction.

TOBACCO

HORNWORMS (Protoparce spp.)

Tennessee. G. M. Bentley (October 28): The third brood of tobacco hornworms, P. sexta Johan. and P. quinquemaculata Haw., in the first, second, and third instars was found in tobacco fields feeding on the leaves that have come out since the tobacco has been cut. The appearance of this brood is common, but normally larvae are killed by cold weather.

L. B. Scott (October 19): Both the above species are very abundant on tobacco suckers. It appears that there will be a large overwintering population. A few late-harvested fields were severely damaged.

TOBACCO FLEA BEETLE (Epitrix parvula F.)

Tennessee. L. B. Scott (October 19): Present in less than normal numbers during the entire season in north-central Tennessee. Damage is light.

MUSHROOMS

A FUNGUS GNAT (Mycophila fungicola Felt)

Maryland. E. N. Cory (October 24): Serious damage resulted from these insects in mushrooms in houses at Reisterstown, Baltimore County. (Det. by C. T. Greene.)

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. Sherman (October 17): Boll weevil above average in abundance during latter part of summer and early autumn throughout the State.

Florida. L. C. Fife and C. S. Rude (October 8): Weevils breeding in many fields in Alachua and Marion Counties, where squares are forming on new growth. (October 15): Population still high in most places in Alachua, Marion, and Lake Counties. In Lake County weevils are reported numerous in all fields. This population has built up since about the middle of August, as prior to that time there were very few weevils in that section. (October 22): Destruction of leaves and squares by the leaf worm (Alabama argillacea Hbn.) has checked weevil population, not in all places but over the greater part of the area. (October 29): Weevil population heavy in Lake, Marion, Gilchrist, and Alachua Counties. Undoubtedly large numbers of weevils are going into hibernation.

Mississippi. C. Lyle (October 26): The number of boll weevils going into hibernation in the Grenada district, Grenada County, this fall is considered the largest seen in many years. Very abundant in the 10 northwestern counties of the State.

E. W. Dunnam and J. C. Clark (October 8): Few can be found in most field of Washington County but they are plentiful in fields with second growth. (October 15): Rapidly decreasing. Some second growth to furnish food in a few fields. (October 29): It is estimated that the population going into hibernation this fall in Washington County just about equals that of a year ago. The weevils, however, are on an average much older, as this dry fall has not been favorable for second growth and weevil breeding. It is though that the remainder of the heavy summer population is in poor condition for successful hibernation.

R. L. McGarr (October 8): Squares still plentiful in many fields in Oktibbeha and Lowndes Counties for weevils to feed on, sustaining a large number to go into hibernation. (October 29): Still common in small areas of cotton not killed by frost. Weather conditions during the last few days have probably caused a number of weevils to go into hibernation. Field conditions indicate that the weevils should enter hibernation in good condition in Oktibbeha and Lowndes Counties.

Louisiana. R. C. Gaines and assistants (October 29): Boll weevils taken on field flight screens in Madison Parish during the month of October totaled 352 in 1938, as compared to 345 in 1937 and 156 in 1936.

Texas. R. W. Moreland and A. B. Beavers (October 1): Population continues to build up in late-planted cotton in Brazos and Burleson Counties. (October 8): Population light in fields where no top crop was produced. Same condition developing in late-planted cotton. A few fields of late-planted cotton have a fairly heavy population in spots of rank cotton. (October 15) Population practically nil in early planted cotton and light in most fields of late-planted cotton. (October 22): Population unusually light in field of early planted cotton, as very few squares and blooms are to be found.

THURBERIA WEEVIL (Anthonomus grandis thurberiae Pierce)

Arizona. W. A. Stevenson, et al. (October 1): Further specimens were found in bolls of cotton from Santa Cruz County and present indications are that the infestation will be considerably larger than in 1937.

BOLLWORM (Heliothis obsoleta F.)

Florida. L. C. Fife and C. S. Rude (October 1): Very few bollworms present in Alachua and Marion Counties. (October 22): No bollworms observed in Alachua, Marion, and Lake Counties.

Mississippi. C. Lyle (October 26): Cotton bolls showing injury received from Madison County on October 10.

Texas. R. W. Moreland and A. B. Beavers (October 1): A number of moths noticed in a field of late-planted cotton visited on September 29. (October 15): A few found in collecting weevils on October 14 in Brazos and Burleson Counties. (October 22): None found in any fields visited on October 21.

Arizona. W. A. Stevenson, et al. (October 1): Indications are that the infestation will be considerably larger than in 1937 in Santa Cruz County. (October 15): Boll examination for determining the percentage of cotton bolls injured by various pests in Santa Cruz County shows that 9.93 percent of the short-staple cotton bolls examined were injured by bollworm, as compared to 3.93 percent in 1937.

COTTON LEAF WORM (Alabama argillacea Hbn.)

South Carolina. F. Sherman (October 16): On a 50-mile tour through the cotton-growing section only two fields, both in Anderson County, were noticed in which defoliation was severe enough to be conspicuous from the road. Defoliation not universal in western South Carolina.

J. G. Watts (October 22): Defoliation rare in South Carolina this season. Only two defoliated fields were seen while traveling through the State. These were in Chester County. Very few moths taken in a trap light at Blackville, Barnwell County.

Georgia. T. L. Bissell (October 11): Moths have been caught almost every night in light traps at Experiment, central Georgia, from September 15 to date, with maximum catches during the period from September 27-30, inclusive. Total moths caught were 1,107; in the period September 27-30, 950, or 86 percent; on September 29, 506, or 46 percent.

O. I. Snapp (October 12): Infestation variable at Fort Valley, central Georgia, this year. In some fields all of the foliage of cotton plants has been devoured, whereas in other nearby fields there has been no feeding.

Florida. L. C. Fife and C. S. Rude (October 22): Plants stripped in many parts of the Sea Island cotton region of Alachua, Marion, and Lake Counties. Too late for damage by this pest. (October 29): Leaf worms have destroyed leaves and squares in most of the plantings in Lake, Marion, Gilchrist, and Alachua Counties and have in this way checked weevil development.

Mississippi. C. Lyle (October 26): Still appearing in fields of late cotton in the vicinity of Senatobia, Tate County.

E. W. Dunnam and J. C. Clark (October 1): Practically all fields in Washington County are 90-percent stripped and second growth is beginning. No small larvae observed. (October 15): This insect has practically disappeared in all fields, regardless of second growth or foliage.

R. L. McGarr (October 1): Very numerous in many fields this week in Oktibbeha and Lowndes Counties.

Oklahoma. C. F. Stiles (October 25): Much cotton defoliated throughout the eastern half of the State. Doing some damage to late cotton on the western side of the State.

Texas. R. W. Moreland and A. B. Beavers (October 1): Moths still abundant in late-planted cotton in Brazos and Burleson Counties, and several spots noticed where worms are ragging the plants. (October 15): A few leaf worms observed in one field on October 14, but no ragging. (October 22): No leaf worms noticed.

COTTON LEAF PERFORATOR (Bucculatrix thurberiella Busck)

Texas. R. K. Fletcher (October 12): Found on seedling cotton in a greenhouse at College Station, Brazos County.

Arizona. W. A. Stevenson, et al. (October 1): During the latter part of September the cotton perforator appeared in large numbers in several fields near Gilbert, Maricopa County. Parts of two large fields just north of Gilbert were almost defoliated. The infestation developed too late in the season to cause any material damage, as the crop had already been made. A severe outbreak occurred in the same locality in 1936.

LEAF APHIDS (Aphididae)

Florida. L. C. Fife and C. S. Rude (October 15): Aphids not numerous in Alachua, Marion, and Lake Counties the first 2 weeks in October. (October 22): No aphids observed in above counties.

Mississippi. E. W. Dunnam and J. C. Clark (October 15): Aphids decreased and became scarce from October 1 to 15 in Washington County. (October 22): There was a slight increase in population above that of last week.

Texas. R. W. Moreland and A. B. Beavers (October 1): Population heavy in field of late-planted cotton visited on September 29. (October 8): Still present in fields of young cotton visited during the week in Brazos and Burleson Counties. (October 15): Present in a field where weevils were collected on October 14, but infestation not heavy. (October 22): No aphids noticed in any of the fields visited on October 21.

COTTON STAINER (Dysdercus suturellus H. S.)

Florida. L. C. Fife and C. S. Rude (October 1): Present in most fields in Alachua and Marion Counties. Not sufficiently numerous to do serious damage in most places. (October 15): Numerous in some fields in Alachua, Marion, and Lake Counties and damaging the lint of the late pick. (October 29): Abundant in some sections of Lake, Marion, Gilchrist, and Alachua Counties, still causing some damage to the late picking of cotton.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Texas. R. W. Moreland and A. B. Beavers (October 1): Still present in fields of young cotton visited in Brazos and Burleson Counties. (October 8): Observed in young cotton during the early part of the week. (October 15): Very few hoppers noticed in field of young cotton where weevils were collected on October 14. (October 22): No hoppers noticed in fields examined on October 21.

FOREST AND SHADE-TREE INSECTS

GYPSY MOTH (Porthetria dispar L.)

Vermont. A. L. Blaisdell (September 23): Single-egg-cluster infestations were discovered in the towns of Goshen and Granville, located within the barrier zone in Addison County. These towns are situated on high elevations in the Green Mountain Range and have not previously been infested. It is evident that these infestations became established as a result of wind spread of caterpillars from an infestation existing along the White River to the east.

Massachusetts. A. F. Burgess (October 20): Recently a new gypsy moth infestation was discovered in the western part of North Adams Township, bordering the Williamstown town line. This infestation is relatively small and ought to be easily exterminated. Its location is several miles from any other infestation found in this particular section for several years.

FOREST TENT CATERPILLAR (Melacosoma disstria Hbn.)

Minnesota. R. H. Nagel (October): Egg-mass counts late in September in the Gunflint area, in northeastern Minnesota, showed that there were only three or four masses per average-sized tree. Although based on a rather small area, the count supports the observations made in July that the number of emerging moths was very low. At that time it was estimated that between 90 and 95 percent of the larvae and pupae would be destroyed by tachinids and sarcophagids.

FALL WEBWORM (Hyphantria cunea Drury)

Rhode Island. A. E. Stene (October 26): This species was not nearly so abundant as last year.

Mississippi. W. L. Douglass (October 26): Absence reported as very noticeable in the Grenada district this fall.

A CATERPILLAR (Heterocampa manteo Dbdy.)

Minnesota. R. H. Nagel (October): A very heavy infestation reported in the Marcell Ranger district of Chippewa National Forest, northern Minnesota. Defoliation of birch, basswood, and oak was very heavy and the affected area resembled those defoliated by the forest tent caterpillar at the peak of the infestation. On an area of 125 square feet prebupal larvae averaged 4.7 per square foot, and the degree of parasitization of specimens taken from under the leafmold appeared to be very low.

CANKERWORMS (Geometridae)

Illinois. W. P. Flint (October 26): Examinations made during the month indicate that pupae are present in the soil in very large numbers and apparently in a healthy condition. There is every indication that the outbreak of last spring will continue in 1939.

BAGWORM (Thyridontaryx enhemeraeformis Haw.)

North Carolina. Z. P. Metcalf (September 30): Reported as seriously damaging ornamentals in Edgecombe County.

Mississippi. M. L. Grimes (October 20): Several infestations on arbor-vitae plants in the vicinity of Meridian were recently reported.

WALKINGSTICK (Disoperomera femorata Say)

Pennsylvania. A. E. Burgess (October): Very heavy feeding was observed early in September in woodlands just east of Woodward, Centre County, on State Highway No. 45. The defoliation of the area as a whole averaged 50 to 60 percent, but in some instances individual red oaks were completely stripped.

TWO-LINED CHESTNUT BORER (Agrilus bilineatus Web.)

New York. E. P. Felt (October 22): Borer has developed in considerable numbers in oak and also in beech in Westchester County, the primary cause probably being weakening following the extreme drought of several years earlier.

PIGEON TREEX (Tremex columba L.)

Nebraska. M. H. Sweek (October 21): Specimens received from Saunders, Cheyenne, Buffalo, and Adams Counties from September 22 to October 6. These insects had been found on mulberry, hackberry, poplar, apple, and elm trees. Presence of its parasite, Thalessa lunator F., reported from Cedar County on September 29.

A LEAFHOPPER (Oncometopia undata F.)

Tennessee. L. B. Scott (October 19): Sharpshooters, probably O. undata, are present in very large numbers on shade trees in north-central Tennessee, particularly on maple, black gum, and hackberry.

ASPEN

A LEAF BEETLE (Chrysomela tremulae F.)

Pennsylvania. L. G. Baunhofer (October): Reported as causing heavy defoliation of aspens in many areas of the Allegheny National Forest, northwestern Pennsylvania, during the season. (Det. by H. S. Barber.)

BIRCH

AN APHID (Uuceraaphis betulae L.)

New Jersey. M. D. Leonard (October 15): Still fairly common on the undersides of leaves of all birches examined in Ridgewood, Bergen County. A liberal sprinkling of true sexual forms present. Damage is light.

CATALPA

SCURFY SCALE (Chionaspis furfura Fitch)

North Carolina. D. L. Wray (October 15): Severe damage to catalpa trees at Charlotte, Mecklenburg County, this year.

CYPRESS

A SCALE (Ehrhornia cypressi Ehrh.)

California. Kern County Monthly News Letter (September 6): The cottony cypress scale is on the increase on Monterey cypress trees and hedges and in some instances the trees are so severely injured that it is advisable to destroy them.

ELM

ELM LEAF BEETLE (Galericella xanthomelana Schr.)

Alabama. J. M. Robinson (October 26): Complaints received from Birmingham about beetles feeding on the leaves of elm. Believed to be the elm leaf beetle.

FIR

D UGLAS FIR TUSSOCK MOTH (Hemerocampa pseudotsugata McD.)

Oregon. F. P. Keen (October): This insect is scattered far and wide over the Blue Mountains of northeastern Oregon. Douglas firs and white firs being defoliated but, as yet, with little loss of timber. The last previous outbreak started 10 years ago and the species simultaneously made its appearance in British Columbia, northeastern Washington, eastern Oregon, and Idaho.

W. L. Buckhorn (August 31): A moderate defoliation of Pseudotsuga douglasii and Abies concolor was noted over an area of 92,000 acres in the Halheur National Forest, southeastern Oregon. Centers of greatest intensity, where the foliage was completely stripped from the hosts, were found in many of the small canyons.

A TUSSOCK MOTH (Hemerocampa oslari Barnes)

California. J. M. Miller (October 18): Serious outbreaks, which have been running during 1935, 1936, and 1937, have resulted in the death of a high percentage of white fir stands east of the Sierra Nevada Mountains in Mono and Inyo Counties. On a survey of these areas in September 1938, practically no evidence of feeding was found. The outbreak has apparently subsided from natural causes.

HACKBERRY

RED-HEADED ASH BORER (Neoclytus acuminatus F.)

Nebraska. M. H. Swenk (October 21): Hackberry trees in Harlan County were reported to be infested on September 23.

HACKBERRY WIPPLE GALL (Pachysylla celtidis-nanma Riley)

Nebraska. M. H. Swenk (October 21): Specimens of hackberry leaves received from Harlan County on September 26. Leaves showed deformation produced by this gall insect.

LARCH

SAWFLIES (Platycampus spp.)

Idaho. J. C. Evenden (October): During the last season Platycampus laricivorus Rohw. and Midd. and P. laricis Rohw. and Midd. were again recorded in epidemic numbers on western larch near Grange, Bonner County. A previous outbreak of these insects was recorded from the laboratory at Coeur d'Alene, Kootenai County, in 1921. The following season this severe epidemic was so effectively reduced by the natural elements of control that there was no evidence of its existence. Apparently this condition is to be repeated with the present outbreak, for, although there were myriads of larvae present within this area during the last season, only a very few overwintering cocoons can now be found.

LOCUST

LOCUST LEAF MINER (Chalepus dorsalis Thunb.)

Rhode Island. A. E. Stene (October 26): About as abundant as last summer.

OAK

AN OAK GALL (Philonix nezomachoides O. S.)

Massachusetts. E. P. Felt (October 22): Moderately abundant in eastern Massachusetts. In no instance was it definitely associated with material injury to its host plant.

Iowa. E. P. Felt (October 22): Reported as numerous at Sioux City.

BORERS (Prionidae)

Rhode Island. A. E. Stene (October 26): Uprooting of trees in Providence by the recent hurricane disclosed considerable damage to oaks from a large root borer, probably a prionid.

Connecticut. W. Turner (October 22): At Hamden dozens of larvae of Prionus laticollis Drury were found in stumps of scarlet and white oaks uprooted by the hurricane. In most cases the trees were not sound.

PINE

BARK BEETLES (*Dendroctonus* spp.)

North Carolina. Z. P. Metcalf (September 30): The southern pine bark beetle (*D. frontalis* Zimm.) is worse than last year, but about average for this pest throughout the State.

Mississippi. M. L. Grimes (October 26): Reported on October 19 that about 4 acres of pine timber near Union, Newton County, had been severely damaged by beetles, and the specimens received proved to be *D. torrens* Oliv., *Ips calligraphus* Germ., and *Platypus flavicornis* F.

Oregon and Washington. F. P. Keen (October): In eastern Oregon and Washington preliminary data received from surveys of the western pine beetle (*D. brevicornis* Lec.) situation in these localities indicate a marked general increase in losses of ponderosa pine caused by this insect. On many sample plots this increase for 1938 runs from 100 to 200 percent of the 1937 loss, which is particularly surprising in view of a general improvement in moisture conditions and tree vitality. The beetle is evidently responding to cyclic factors which are not related to host conditions.

California. J. W. Miller (October 18): A noticeable increase in the activity of the western pine beetle was observed in the southern Sierra region late in the summer of 1938. The two preceding seasons have been marked by an endemic condition of the infestation, with low timber losses. As yet the recent increase is of mildly aggressive character and it is too early to assume that it is the forerunner of an epidemic outbreak.

DEODAR WEEVIL (*Pissodes nemorensis* Germ.)

Maryland. E. N. Cory (September 28): Reported from Dickerson, Montgomery County, on magnolia pine.

SAWFLIES (*Neodiprion* spp.)

Indiana. J. J. Davis (October 3): An unprecedented outbreak of pine sawflies, which are defoliating or partially defoliating pine trees in practically all sections of the State. In some cases individual trees were defoliated, while in others entire groves were attacked. Adults not yet reared but larvae identified by R. A. Cushman as Abbott's pine sawfly (*N. pinetum* Nort.).

Mississippi. C. Lyle (October 26): Specimens of N. lecontei Fitch on pine received from Jefferson County on September 29 with a report of moderate damage.

MANTUCKET PINE SHOOT MOTH (Rhyacionia frustrans Const.)

Massachusetts. A. I. Bourne (October 24): Samples were received on August 20 of injured shoots of pine, first observed from an airplane circling over the cape and the adjacent islands. Specimens were taken from an area of damaged pines from Edgartown, on Martha's Vineyard. The observer reported that the whole patch of pine trees looked like a great brown rug spread out as seen from the air. The area was later visited and samples collected. Identification confirmed by Federal laboratories at New Haven.

Tennessee. G. M. Bentley (October 22): Reported as causing injury to pines on the campus of Columbia Military Academy at Columbia, Maury County.

Mississippi. M. L. Douglass (October 26): Injury to young pine growth reported as common at Grenada.

A NEEDLEMINER (Recurvaria sp.)

California. J. H. Miller (October 18): An active infestation, found by J. E. Patterson southeast of Mono Lake, Mono County, had caused serious damage to pinon pine. This is the first record of defoliation of pinon in California areas by this needleminer, which is apparently very close to R. mulleri Busck. It is of considerable importance as the Mono and Piute Indians use this area for gathering supplies of pinon nuts. Approximately 7,000 acres have been defoliated and of this 2,000 acres have been killed outright. Approximately 90 percent of the needles of the growth prior to 1938 have been mined.

PINE APHID (Cinara strobi Fitch)

Connecticut and New York. E. P. Felt (October 22): Pine aphids, particularly this species, have been sufficiently abundant to cause material injury to white pines, both on western Long Island, N. Y., and in southwestern Connecticut.

A SCALE (Toumeyella numismaticum Pat. and McDan.)

Ohio. E. W. Mendenhall (September 16): Chinese pine (Pinus sinensis) infested with a scale insect found in a nursery at Newark, Licking County (det. by H. Morrison). Lepidopterous larvae, probably Laetilia coccidiivora Const., also found on the twig, are presumed to have been feeding on the scale (det. by C. Heinrich).

SPRUCE

A SAWFLY (Pikonema dimmockii Cress.)

Michigan. H. J. MacAloney (September 14): A few full-grown larvae of this spruce sawfly found on black spruce on August 8 in the Marquette National Forest, Upper Peninsula.

EUROPEAN SPRUCE SAWFLY (Diprion polytomum Htg.)

New England and New York. J. V. Schaffner, Jr. (October 29): An intensive survey of spruce areas in New Hampshire, Vermont, and New York showed that the sawfly **was** present in at least small numbers wherever inspections were made. A very heavy infestation occurs on Mt. Monadnock and on Pack Monadnock and Temple mountains near the Petersboro-Temple town line, south-central New Hampshire. A medium to heavy infestation occurs in the northern part of the town of Pittsburg near Mt. Kent, in extreme northern New Hampshire. In southern Vermont a very heavy infestation occurs in the towns of Wilmington and Marlboro, while medium to heavy infestations occur on Mt. Ellen, Mt. Abraham, Mt. Battell (in central Vermont), and Green Peak in Dorset. The heavy 1937 infestation at Lincoln, Vt., seems to be reduced somewhat this season. In New York a number of medium to heavy infestations were found on spruce plantations in Columbia, Dutchess, Ulster, Otsego, and Chenango Counties. It is also numerous in some of the older stands in the Adirondacks, but this season no infestations with noticeable defoliation were found there. No survey work was done in Maine this summer but reports indicate that there has been an increase in the intensity of the infestation in northern Maine, and about four towns in Washington County are reported as heavily infested that were only lightly infested last year.

TULIPTREE

TULIPTREE SCALE (Toumeyella liriodendri Gmel.)

Mississippi. C. Lyle (October 26): Tuliptree twigs showing a medium infestation sent in on September 22 from Yazoo City.

WALNUT

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Nebraska. M. H. Swenk (October 21): Walnut trees reported infested on September 28 in Otoe County.

WILLOW

POPLAR AND WILLOW BORER (Cryptorhynchus lapathi L.)

Oregon. D. C. Mote (October): Young larvae observed in willow and poplar at Portland.

AN APHID (Lachnus sp.)

Michigan. R. Hutson (October 22): Very abundant on willow at East Lansing, Owosso, Ionia, Kalamazoo, Benton Harbor, Dundee, Detroit, and Ann Arbor.

INSECTS AFFECTING GREENHOUSE
AND ORNAMENTAL PLANTS

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

North Carolina. D. L. Wray (October 1): Severe damage noticed wherever candytuft was grown in western North Carolina. Plants completely defoliated.

Kansas. H. R. Bryson (October 28): Congregated in flower gardens and causing some injury to blooming chrysanthemums. Late beans that were not frozen showed considerable injury to the leaves. They are more abundant in Kansas than for several years.

A SCARABÆID BEETLE (Ochrosidia borealis Arrow)*

West Virginia. C. H. Hadley (October): Extensive turf injury reported on grounds of a country club at Wierton, Hancock County. Examination of specimens in October showed that the species causing the damage was O. borealis. Infestation is general over the entire 150 acres of the course, where larval counts run from 10 to about 150 per square foot. Turf on two adjoining estates also heavily infested. Control measures being used over the entire course.

Ohio. J. S. Houser (October 26): This insect has been very abundant this year, particularly in the northern part of the State. Some of the insects are still feeding, although others have started to burrow deeper into the soil. It is no uncommon experience to find large areas of turf completely destroyed.

A TREEHOPPER (Enchenopa binotata Say)

New York. R. W. Horsey (October): Many egg masses on viburnum, also one adult was found on October 20 at Rochester.

HAIRY CHINCH BUG (Blissus hirtus Montd.)

Rhode Island. A. E. Stene (October 25): Reported in two or three places but damage done was not so great as that of last year.

BEALYBUGS (Pseudococcus spp.)

New Jersey. M. D. Leonard (October 25): Several large out-of-door window boxes of coleus observed at Ridgewood in September, with the plants moderately to severely infested by P. citri Risso. Early in October all of the plants in a couple of boxes had been killed

* Note: Blanchard described a species from Bolivia as villosa in the genus Cyclocephala in 1846. Burmeister described villosa in the same genus in 1847. G. J. Arrow in Ann. Mag. Nat. Hist. (vol. 8, p. 172, 1911) substituted borealis for villosa Burm., the North American species.

North Carolina. D. L. Wray (October 1): Considerable damage done to catalpa and barberry in the vicinity of Charlotte.

Mississippi. J. Milton (October 26): An unusually heavy infestation on magnolia trees at Jackson reported on September 21.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Mississippi. C. Lyle (October 26): A light infestation on rose in Hinds County reported on September 20. An infestation on Satsuma at Moss Point reported on October 1.

Arizona. C. D. Lebert (September 29): Several pittosporum plants killed in the Phoenix-Mesa area during September. In one instance the scale had gone over to adjoining citrus; where a light infestation was found.

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. C. D. Lebert (September 25): A heavy infestation found on roses, euonymus, privet, chinaberry, oleander, and arborvites in a yard at Phoenix during September. Several plants were removed and many cut back severely and sprayed.

CHRYSANTHEMUM

CHRYSANTHEMUM APHID (Macrosiphonella sanborni Gill.)

New Jersey. M. D. Leonard (October 20): Still present in moderate numbers on many plants outdoors in Ridgewood. Winged forms not numerous. Damage negligible.

CORALTREE

MOTHS (Pyralididae)

Louisiana. J. M. Singleton (October 15): Larvae of Agathodes designalis Guen. defoliating coraltree (Erythrina indica) in various sections of New Orleans. Larvae of Terastia meticulosalis Guen. boring in the stems and seed pods of coraltrees, are apparently doing considerable damage to that host throughout the city of New Orleans. (Det. by C. Heinrich.)

CRAPEMYRTLE

CRAPEMYRTLE APHID (Myzocallis kahawaluokalani Kirk.)

Mississippi. C. Lyle (October 26): Heavy infestations on crapemyrtle are general throughout the Meridian district.

DAHLIA

SOFT SCALE (Coccus hesperidum L.)

Alabama. J. H. Robinson (October 22): Reported on Dahlia plants at Tallent, Jefferson County, on October 17.

EUONYMIUS

EUONYMIUS SCALE (Chionaspis euonymi Comst.)

North Carolina. Z. P. Metcalf (September 30): Doing usual amount of damage throughout the State.

Alabama. J. H. Robinson (October 22): Reported on japonicas at Dothan, Houston County, on October 26.

Mississippi. W. L. Douglass (October 16): Several euonymus plants at Grenada reported as completely killed by this scale.

HAWTHORN

WOOLLY APPLE ATHID (Liriosoma laniferum Hahnsm.)

New York. R. E. Horney (October): Numerous at Rochester on October 18 on the branches of hawthorn (Crataegus mollis or related species). Evidently it had been quite severe earlier in the season. Washington hawthorn (C. cordata) apparently not infested, although grown next to infested trees. Also numerous on the branches of Sargent crab apple (Malus sargentii).

MULBERRY WHITEFLY (Petroleurodes mori Quaint.)

Delaware. E. P. Felt (October 22): Reported in moderate numbers on hawthorn at Wilmington.

HYACINTH

BULB MITE (Rhizoglyphus hyacinthi Bev.)

North Carolina. D. L. Wray (October 12): Severe damage done to a collection of hyacinths at a greenhouse in the vicinity of Raleigh.

JUNIPER

JUNIPER SCALE (Diurris caryocarpae Targ.)

North Carolina. D. L. Wray (September 30): Severe damage to junipers throughout the western part of the State. Most severely infested localities were Asheville, Charlotte, and Winston Salem. Worse now than for many years.

NINEBARK

AN APHID (Myzus sp.)

New Jersey. M. D. Leonard (October 25): An undetermined species of Myzus, which occurs during the fall has again been present in some numbers on several large ninebark bushes at Ridgewood. As usual, apparently only true sexual forms are present. Very few remain, as most of the leaves are off.

PRIVET

A SCALE (Parlatoria olea Colv.)

Maryland. E. N. Cory (October 1): Reported on privet at Baltimore.

RHODODENDRON

A LEAF MIDGE (Giardomyia sp.)

Connecticut and New York. E. P. Felt (October 22): Noticed several times during the last summer in southeastern New York and southwestern Connecticut, the maggots developing in the young leaves and later producing a condition suggestive of fungus infection.

RHODODENDRON BORER (Conopia rhododendri Beut.)

Maryland. E. N. Cory (October 24): Heavy infestation at Pikesville, Baltimore County.

ROSE

LEAFHOPPERS (Cicadellidae)

Utah. G. F. Knowlton (October 18): Conspicuous damage caused to rose foliage during the season in many localities in northern and central Utah.

INSECTS ATTACKING MAN AND
DOMESTIC ANIMALS

MAN

MOSQUITOES (Culicinae)

New Jersey. F. C. Bishopp (October 25): On October 21 salt marsh mosquitoes (Aedes sollicitans Walk.) were observed in restricted areas near Barnegat Bay. This mosquito was rather abundant and bit viciously. Elsewhere on a 2-day tour of the northeastern part of New Jersey and the central part of the State along the coast very few mosquitoes were in evidence.

Maryland. F. C. Bishopp (October 25): On October 16 the salt marsh mosquito and the flood water mosquito (A. vexans Meig.) were causing much annoyance to residents of Bay Ridge, Anne Arundel County, and were reported to have been more troublesome during the last 2 weeks than earlier in the season.

Tennessee. G. M. Bentley (October 24): A. aegyptii L. still common in buildings.

Iowa. H. E. Jaques (October 25): More complaints received concerning mosquitoes this fall than for a number of years.

Missouri. L. Haseman (October 25): A recent check-up on mosquitoes, in connection with a rather severe outbreak of equine encephalomyelitis, has shown that throughout the State there has been an unusual epidemic of mosquitoes this fall. Collections show two species, A. vexans and Culex pipiens L., to be most abundant, with a considerable number of Anopheles punctipennis Say. Owing to the scarcity of rain, mosquitoes have had an ideal chance to breed where water holes were available and spread to surrounding areas.

Kansas. H. R. Bryson (October 28): Reported on October 25 that mosquitoes were abundant late in September and the first week in October. Few observed recently.

Texas. E. W. Leake (October 20): Mosquitoes are scarcer at Dallas than they have been for a number of years.

CLEAR LAKE GNAT (Chaoborus sp.)

California. A. W. Lindquist (September 30): A study of adult abundance, by means of light traps, in the vicinity of Clear Lake, Lake County, indicated a daily fluctuation from 0 to over 16,000,000, with a peak period from August 28 to September 2, and an irregular decline thereafter. A total of 291.5 quarts, or 111 pounds, of gnats were taken in one trap during a 32-day period.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Massachusetts. C. N. Smith (October 18): Activity almost ceased by October 1 but a few scattered specimens were taken as late as October 10 on Martha's Vineyard.

BROWN DOG TICK (Rhipicephalus sanguineus Latr.)

Virginia. H. G. Walker (October 28): Reported as rather heavily infesting dogs in Norfolk. The ticks were also causing a great deal of annoyance by crawling all over several rooms in this home. (Det. by H. E. Ewing.)

Correction: The note on Dermacentor variabilis Say reported in Insect Pest Survey Bulletin dated October 1 (vol. 18, no. 8, p. 571) was incorrect, as the nymphs were later determined by R. A. Cooley as R. sanguineus.

BLACK WIDOW SPIDER (Latrodectus mactans F.)

Virginia. F. C. Bishopp (October 25): On October 24 these spiders were reported to be extremely abundant on a farm in Fairfax County. Thirty were killed in a relatively brief examination about the house. Spiders of various sizes were present.

District of Columbia. J. M. Brennan (October 25): Investigation of an infestation in a residential section of Washington substantiated the report that this species is fairly abundant. On September 14 almost every drain-pipe in a stone retaining wall extending for two blocks contained one or more female spiders in various stages of development. Six egg cases were present in one nest. The food supply appeared to consist principally of beetles, especially Phyllophaga sp. On revisiting this section on October 11, 22 female spiders, 3 of which were mature, were found within half an hour.

Nebraska. M. H. Swenk (October 21): Inquiries as to control around school buildings and in caves were received from Polk, Platte, Boone, and Wheeler Counties from September 21 to October 20.

Kansas. J. R. Horton (October 3): Three females observed at different times during July, in a weather instrument shelter and in other outbuildings. Several specimens -- male, female, and young -- were brought to the laboratory for identification.

Utah. G. F. Knowlton (October 15): A large black widow spider took up residence in my own house at Logan, causing annoyance to the family until it was destroyed.

CATTLE

SCREWORM (*Cochliomyia americana* C. & P.)

Georgia. E. E. Rogers (October 28): Infestations of C. americana decreased sharply during the last week in September and the first 2 weeks of October, but increased enormously during the third week of October on experimentally wounded animals at Valdosta. Four cases occurred from September 26 to October 2; 4 cases from October 3 to 9; 7 cases from October 10 to 16; and 52 cases from October 17 to 26. One infestation of blowflies (Sarcophaga sp.) and one of green blowfly (Lucilia sp.) were noted during the last month on experimentally wounded animals at Valdosta. Specimens of C. macellaria F. infested with Empusa were found on October 3, 10, and 16 in the status-trap collections.

T. L. Bissell (October 11): Two reports from Orchard Hill, Spalding County, that hogs have been attacked by screwworms (Cochliomyia sp.) following castration.

Florida. T. H. Vanderford (October 6): In Hernando, Citrus, and Dixie Counties the screwworm incidence was about the same as last year. In Levy County an increase in infestations was reported, while in Taylor County a severe outbreak occurred during the summer, but the general incidence was about the same as last year.

F. S. Chamberlin (October 20): Reports indicate that screwworm infestations on hogs and cattle are rather severe in Gadsden County.

Alabama. J. M. Robinson (October 22): C. americana has been active at the following places: Autaugaville, Autauga County; Ramer, Montgomery County; Union Springs, Bullock County; and Selma, Dallas County. Worms are ~~attacking~~ young calves and recently dehorned cattle.

Iowa. C. J. Drake (October 6): A few flies were taken from the wounds caused by castration of hogs at Pierson, Woodbury County. (Det. by D. G. Hall.)

Texas. E. W. Laake (October 20): Reports on October 15 indicate that there are very few screwworm cases in the vicinity of Guthrie, King County.

STABLEFLY (*Stomoxys calcitrans* L.)

Massachusetts. C. N. Smith (October 18): Severe annoyance caused near beaches on Martha's Vineyard during the first part of October. The flies were found breeding in large numbers in seaweed, beach grass, and other vegetation, a large quantity of which had been piled up along the shore by the recent hurricane.

Gulf coast and Atlantic seaboard. F. C. Bishopp (October 25): Reports during October indicate that rather severe outbreaks occurred along

the western and eastern coasts and in inland Florida, and along the Atlantic coast as far north as Massachusetts. A number of specimens were observed along the coast in the vicinity of Barnegat Bay, N. J., and at times they caused annoyance to man by their bites.

Texas. E. W. Laake (October 20): During October stableflies have continued to be very scarce, probably fewer for this time of the year than for the last 10 years.

HORN FLY (Haematobia irritans L.)

Georgia. A. L. Brody (October 28): Very abundant. About 1,000 per animal on 8 young steers were observed at Valdosta from October 24 to 27.

Texas. E. W. Laake (October 20): Horn flies averaged at least 2,000 per head on 30 or 40 milk cows at Dallas on October 15; at least 4,000 per head on 50 Hereford cows on a ranch at Cresson; and from 3,000 to 6,000, with an average of approximately 3,500 per head, on 105 Hereford cattle in King County.

COMMON CATTLE GRUB (Hypoderma lineatum DeVill.)

Texas. E. W. Laake (October 20): On October 14 grubs averaged 7.4 per head on cattle in King County. Approximately 1 percent of the larvae were young third-stage specimens, the remainder being of the first and second instars.

SHORT-NOSED CATTLE LOUSE (Haematopinus eurytarnus Nitz.)

Texas. E. W. Laake (October 15): Common on Hereford cattle in King County and extremely abundant on some animals.

EAR TICK (Ornithodoros megnini Duges)

Texas. E. W. Laake (October 15): The ear tick is very abundant in King County, practically all cattle examined being infested.

GULF COAST TICK (Amblyomma maculatum Koch)

Georgia. A. L. Brody (October 28): The numbers have decreased considerably during the last month. An average of 0.7 tick per animal was found at each semiweekly examination of sheep at Valdosta.

Florida. H. T. Vanderford (October 6): In general, this tick was not as numerous as last year in Hernando, Citrus, Levy, Dixie, and Taylor Counties.

HORSES

HORSE BOTFLIES (*Gasterophilus* spp.)

Missouri. L. Haseman (October 25): Eggs of the common horse bot are still abundant on the legs of horses in the central part of the State, the flight of the adults continuing unusually late this year.

Texas. E. W. Laake (October 20): On October 15 in King County the common horse botfly is active and ovipositing to the extent that the forelegs and breasts of most horses are literally covered with ova. Reports indicate that the whole county is so affected.

HORSEFLIES (*Tabanidae*)

Ohio. J. S. Houser (October 26): On two occasions this fall at Marysville, Union County, clover seed submitted for purity analysis has been found to contain tabanid eggs in numbers sufficiently large to attract attention. It is estimated that these eggs constituted from 1 to 2 percent of the bulk of the sample.

POULTRY

BEDBUG (*Cimex lectularius* L.)

Nebraska. M. H. Swenk (October 21): Reported as infesting poultry houses in Boone County on September 26, in Saline County on September 28, and in Burt County on October 10.

FOWL TICK (*Argas miniatus* Koch)

Montana. H. B. Mills (October 22): One fowl tick collected at Haxby on October 8. (Det. by R. A. Cooley.)

SHEEP

SHEEP BOTFLY (*Oestrus ovis* L.)

Georgia. A. L. Brody (October 28): Twelve goats and 3 sheep were examined at Valdosta from October 1 to 19 for the nose bot, and 31 larvae were recovered, of which 24 were young first-stage. The latter were found on the walls of the nasal passages and on the turbinate bones. Five second-stage larvae and 2 third-stage larvae were found in the frontal sinuses.

Utah. G. F. Knowlton (September 23): Head maggots in sheep reported to be causing losses each year for the last few years at Meadow, Millard County, west-central Utah.

BLACK-LEGGED TICK (*Ixodes ricinus scapularis* Say)

Georgia. A. L. Brody (October 28): On October 6 the first specimen was seen on sheep at Valdosta. This species has increased in numbers during the last month.

RATS AND MICE

A BOTFLY (Cuterebra sp.)

Rhode Island. A. E. Stene (October 26): A botfly puparium found on a mouse was sent in from Slocum, with the statement that many mice and rats have been found infested in a similar manner.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Isoptera)

Minnesota. A. G. Ruggles (October 25): Termite infestation still confined to within the city limits of Luverne. No authentic report of even one specimen being found outside this area.

ANTS (Formicidae)

Mississippi. C. Lyle (October 26): Specimens of Monomorium pharaonis L. sent in on October 5 from Shelby, Bolivar County, with the report that they were causing considerable annoyance in a house. The Argentine ant (Iridomyrmex humilis Mayr) infestation in the city of Clarksdale reported as unusually heavy at present. Fire ants (Solenopsis xyloni McCook) have been very numerous on properties in the city of Jackson during the last month.

Oregon. W. J. Buckhorn (September 18): Three bundles of western red cedar shingles had been stored for 5 years under shelter in the dark in the Umatilla National Forest. When opened, the entire center of the bundle had been hollowed out, leaving only a shell. The brood of carpenter ants (Camponotus sp.) was abundant in all stages of development.

FIELD CRICKET (Gryllus assimilis F.)

Michigan. R. Hutson (October 22): Very numerous in northern Michigan, in the area where grasshoppers have also been numerous. In making grasshopper surveys in Cheboygan, Presque Isle, Otsego, Montmorency, Alpena, Alcona, and Oscoda Counties, from 1 to 30 crickets per square yard are reported. There are sometimes as many as 100 per square yard in concentrated areas.

Kansas. J. R. Horton (October 26): The common field cricket was about normally abundant in the Wichita area during the last 3 months. No noticeable damage was done to crops, but the insect caused considerable annoyance to householders, becoming very numerous in cellars, basements, and, in some instances, in upper parts of the houses.

BARKLICE (Psocidae)

Massachusetts. A. I. Bourne (October 24): Have just received from F. J. Chapman identification of the psocids mentioned in a report published in the Insect Pest Survey Bulletin, October 1 (vol. 18, no. 6, p. 383). Two species were found, namely, Lichenonima lugens Hagen and Psocus striatus Walker. L. lugens was the predominating species.

A FLY (Prodesmotopa latines Meig.)

Ohio. J. S. Houser (October 17): These small agromyzid flies invaded a dwelling at Wadsworth in great abundance. Determined by C. T. Greene who says that the species is a scavenger which breeds in a great variety of decaying vegetable and animal matter.

BOXELDER BUG (Leptocoris trivittatus Say)

Pennsylvania. E. J. Udine (October 15): Found in considerable numbers on the warm sides of houses at Carlisle. Many gain entrance and are bothersome to the householders. In the past their presence was reported from only one section of the borough, but this year they can be found in nearly all parts of it.

Nebraska. M. H. Swank (October 21): Proving annoying in Butler County on October 17.

Kansas. H. R. Bryson (October 25): Boxelder bugs are returning to their normal abundance after being scarce during the last 3 or 4 years.

ANGLOMOIS GRAIN MOTH (Sitotroga cerealella Oliv.)

South Carolina. O. L. Cartwright (October): Infestation of corn in the field seems greater than usual.

Alabama. J. M. Robinson (October 22): Found in wheat at Athens on October 14.

A BORER (Hylotruncus bajulus L.)

Massachusetts. A. I. Bourne (October 24): Early in September specimens received of a borer taken from walls of a house in Brockton, with the report that the walls were completely riddled and borers coming out of the shingles. Carolina pine was used in the construction of the house, which was built about 4 years ago. A similar outbreak reported from Bridgewater, also in Plymouth County, during mid-September.

TULE BEETLE (Agonum maculicollis Dej.)

California. G. H. Kaloostian (October 17): Reported entering a house and getting into shoes and other clothing and furnishings. They

were most plentiful around the ranch house, within 4 feet of the building, where their abundance was described in a telephone report as "one to every square inch." Specimens brought in.

CIGARETTE BEETLE (Lasioderma serricorne F.)

Nebraska. M. H. Swenk (October 21): Infesting a house in Douglas County on October 10.

STORED GRAIN INSECTS (Coleoptera)

North Carolina. Z. P. Metcalf (September 30): Grain weevils, Sitophilus granarius L., reported as attacking popcorn in Wilkes County. (October 7): Doing serious damage to peas and beans in Wilkes County.

South Carolina. O. L. Cartwright (October): The rice weevil (Sitophilus oryza L.) is abundant in all fields examined. One field near Walterboro, Colleton County, had 97 percent of the corn infested; another at Varnville, Hampton County, had 87 percent of the ears infested. Infestations above 50 percent are common.

Alabama. J. M. Robinson (October 22): The cadelle (Tenebroides mauritanicus L.) reported as attacking rye seed at Leroy.

Ohio. J. S. Houser (October 18): At Elyria serious damage to stored wheat of a rather poor quality caused by the saw-toothed grain beetle (Oryzaephilus surinamensis L.). An undetermined small hymenopteron was very abundant in samples of wheat submitted, which suggests possible parasitic attack. (October 24): According to sample of wheat submitted, the rust red flour beetle (Tribolium castaneum Hbst.) is causing serious damage to stored wheat at Galion.

Michigan. R. Hutson (October 22): One infestation of Calandra granaria L. found at Charlotte. Infestations of grain-infesting insects common south of the line drawn from Muskegon to Saginaw. Two species of Tribolium are the commonest found.

Minnesota. A. G. Ruggles. (October 20): Typhaea fumata L., a Mycetophagid beetle, was identified as a species reported as overrunning an apartment house in Minneapolis. This species has also appeared in grain in farm bins in at least two localities in southern Minnesota during the last 3 or 4 months.

Missouri. R. T. Cotton (October 17): Specimens of a beetle, Monotoma parallela Lec., collected by T. F. Winburn in June 1934 in a small cereal mill in Kansas City, has recently been identified by W. S. Fisher. This appears to be the first record of this species attacking stored cereal products, although an allied species, M. quadrioveolata Aube, has been recorded in Russia as infesting waste grain.

California. G. H. Kaloostian (September 26): Two specimens of the lesser grain borer (Rhizopertha dominica F.) were taken in a rotary net operated in a raisin storage plant at Fresno. These are the first we have seen here.

A MITE (Rhizoglyphus phylloxerae Riley)

Ohio. J. S. Houser (September 17): A stock-food manufacturer and dealer submitted a sample of feed from Massillon, Stark County, northeastern Ohio, heavily infested with this mite. Retailers of the feed were reported to be complaining of the annoyance the mites caused. (Det. by P. Garman.)

INSECT PEST SURVEY BULLETIN

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DISTRIBUTION AND COLONIZATION OF EUROPEAN CORN BORER PARASITES IN 1938

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Incident to the colonization of parasites for the control of the European corn borer (Pyrausta nubilalis Hbn.), five species, viz: Chelonus annulipes Wesm., Microbracon brevicornis Wesm., Macrocentrus gifuensis Ashm., Phaeogenes nigridens Wesm., and Inareolata punctoria Roman, were available for distribution in 1938. All adults of C. annulipes released were reared at the Toledo, Ohio, laboratory with Ephestia kuehniella Zell. as the host. M. brevicornis was reared on P. nubilalis at the Moorestown, N. J., laboratory. Stocks of C. annulipes and M. brevicornis for breeding purposes were supplied through the courtesy of the staff of the Dominion Parasite Laboratory located at Belleville, Ontario, Canada. M. gifuensis and I. punctoria adults were reared from P. nubilalis larvae collected in Massachusetts, and P. nigridens was imported from Italy.

A total of 144,372 parasite adults were shipped in 39 consignments and of this number 31 shipments were made for utilization on P. nubilalis in the infested areas in the United States and Canada. Eight shipments were made to supply parasites for testing on the sugarcane moth borer (Diatraea saccharalis F.) in Louisiana, Florida, and Puerto Rico. The shipments of each species and the mortality that occurred en route are shown in tables 1 to 5. In table 6 all parasite shipments made in 1938 are summarized by species.

Table 1.--Shipments of Chelonus annulipes during the 1938 season

Date	:C. annulipes: : shipped	Mortality	: Destination	:Shipping : method
	: Number	: Number : Percent:		
Jan. 6	1,800	: 1,331: 73.9	: Puerto Rico	: Air ^{1/}
March 8	2,000	: 297: 14.8	: do.	: Do.
May 9	2,000	: 19: 1.0	: Tasley, Va.	: Rail
17	2,000	: 0: 0	: Philadelphia, Pa.	: Do.
24	2,000	: 13: .7	: do.	: Do.
25	2,000	: 4: .2	: do.	: Do.
26	2,000	: 4: .2	: do.	: Do.
27	3,000	: 29: 1.0	: New Haven, Conn.	: Do.
June 2	7,000	: 194: 2.8	: Springfield, Mass.	: Do.
7	6,000	: 14: .2	: New Orleans, La.	: Do.
8	6,000	: 2,775: 46.2	: West Palm Beach, Fla.	: Air ^{1/}
9	32,000	: 9,363: 29.2	: Puerto Rico	: Do.
13	4,000	: 6: .2	: Springfield, Mass.	: Rail
14	1,000	: 0: 0	: Adams, Ohio	: Automobile
16	24,000	: 9,044: 37.7	: Puerto Rico	: Air ^{1/}
21	2,000	: 42: 2.1	: do.	: Rail and boat
23	3,000	: 12: .4	: Springfield, Mass.	: Rail
23	4,000	: 2,264: 56.6	: Puerto Rico	: Air
25	538	: 0: 0	: Adams, Ohio	: Automobile
Total	106,338	: 25,411: --	: --	: --
Average ..	--	: --: 23.9	: --	: --

^{1/} Shipment delayed en route and/or extended release period.

Table 2.--Shipments of Microbracon brevicornis during the 1938 season

Date	:M. brevicor: : nis shipped:	Mortality	: Destination	:Shipping : method
	: Number	: Number : Percent:		
March 24.....	2,350	: 164 : 7.0	: Tasley, Va.	: Rail
31.....	3,000	: 29 : 1.0	: do.	: Do.
April 12.....	1,860	: 244 : 13.1	: do.	: Do. ^{1/}
20.....	6,000	: 6 : .1	: Burlington, N. J.	: Automobile
25.....	5,863	: 0 : 0	: Atlantic, N. J.	: Do.
May 3.....	5,000	: 48 : 1.0	: New Haven, Conn.	: Rail
9.....	5,000	: 29 : .6	: Jamesport, N. Y.	: Automobile
Total.....	29,073	: 520 : --	: --	: --
Average ..	--	: --: 1.8	: --	: --

^{1/} Shipment delayed en route.

Table 3.--Shipments of Macrocentrus gifuensis during the 1938 season

Date	M.gifuensis: shipped	Mortality	Destination	Shipping method
	Number	Number:Percent		
March 26	1,000	60 : 6.0	Belleville, Canada	Air-rail
29	1,065	45 : 4.2	do.	Do.
April 5	500	28 : 5.6	do.	Do.
August 6	748	0 : 0	Burlington, N. J.	Automobile
13	1,650	3 : .2	do.	Do.
17	96	2 : 2.1	do.	Do.
Total	5,059	138 : --	--	--
Average	--	-- : 2.7	--	--

Table 4.--Shipments of Phaeogenes nigridens during the 1938 season

Date	P.nigridens: shipped	Mortality	Destination	Shipping method
	Number	Number:Percent		
April 25	18	0 : 0	Burlington, N. J.	Automobile
August 30	2,000	3 : 0.2	do.	Do.
31	2,000	11 : .6	Atlantic, N. J.	Do.
Total	4,018	14 : --	--	--
Average	--	-- : 0.3	--	--

Table 5.--Shipments of Inareolata punctoria during the 1938 season

Date	I.punctoria: shipped	Mortality	Destination	Shipping method
	Number	Number:Percent		
April 5	200	2 : 1.0	Belleville, Canada	Air-rail
August 13	105	0 : 0	Burlington, N. J.	Automobile
17	52	0 : 0	do.	Do.
19	27	2 : 7.4	do.	Do.
Total	384	4 : --	--	--
Average	--	-- : 1.0	--	--

Table 6.--Summary of shipments of European corn-borer parasites during the 1938 season

Species	Parasites		Mortality	
	shipped			
	Number	Number	Percent	
<u>Chelonus annulipes</u> Wesm.	106,338	25,411	23.9	
<u>Microbracon brevicornis</u> Wesm.	29,073	520	1.8	
<u>Macrocentrus gifuensis</u> Ashm.	5,059	138	2.7	
<u>Phaenogenes nigriceps</u> Wesm.	4,018	14	.3	
<u>Inareolata punctoria</u> Roman	384	4	1.0	
Total	144,872	26,087		
Average	--	--	18.0	

Shipments were made in screen-sided metal cans wrapped in moist cloth strips and enclosed in corrugated paper cartons. Those consignments sent by air express had a thick outer wrapping of moistened cotton covered with cloth. Rail shipments were made in insulated shipping boxes as described in Entomological Technique Circular 77, with provision for re-icing en route, at the end of 15 hours, for all shipments requiring over 24 hours' shipping time. Rail transportation, as described above, proved far superior to air shipments in lower mortality of parasites, lower cost, convenience, and safety. High mortality of Chelonus annulipes occurred in shipments made by air express to Florida and Puerto Rico. The mortality incurred in air shipments of this parasite was 35.9 percent, partly due to delays en route, compared to a mortality of only 0.9 percent for shipments of this same species by other means. While the average mortality for all shipments was 18 percent, this was due almost exclusively to the high mortality in the air shipments of C. annulipes, mortality in shipments of all other species averaging only 1.8 percent. All shipments of C. annulipes were made from the Toledo laboratory and shipments of other parasites were made from the Moorestown, N. J., corn borer laboratory.

During the 1938 colonization season a total of 63,485 parasites of 5 species were released in 30 counties in 8 States. A list of all releases of European corn borer parasites made during 1938 is given in table 7 by States. Table 8 lists all releases of parasites made against the corn borer in the United States up to December 31, 1938.

A major objective of the 1938 parasite-colonization program was the distribution of the egg-larval parasite Chelonus annulipes over a greater portion of the area infested by the multiple-generation strain of the corn borer, as C. annulipes has become well established on this strain in southeastern Massachusetts and shows possibilities of becoming a valuable factor in retarding the liberations in Lucas County, Ohio, in districts where the borer has recently been observed to pass through two generations annually, were made in 1938. A total of 28,257 adults of C. annulipes were released. Map 1 shows the area colonized in 1938 and in previous years.

The releases of C. annulipes in the Eastern States were made a few days before the normal optimum date because conditions in April indicated an earlier host-egg-deposition period than usual. However, owing to unseasonably cool weather later, host oviposition was no earlier than normal. The releases of C. annulipes in Ohio were well synchronized with the presence of host eggs in the field.

Table 7.--Liberations of European corn borer parasites in the United States in 1938, by States

State and county	Township	Date of release	Parasite species released					Total
			Chelonus annulipes	Microbracon brevicornis	Macrocentrus gifuensis	Phaeogenes nigridens	Inareolata punctoria	
Connecticut:								
Fairfield	Fairfield	May 29	988					988
Hartford	E. Hartford	3		4,952				4,952
Middlesex	Haddam	29	994					994
New London	E. Lyme	29	989					989
Total	--	--	2,971	4,952				7,923
Maryland:								
Worcester	Newark	Apr. 13		1,616				1,616
Do.	do.	May 10	1,981					1,981
Total	--	--	1,981	1,616				3,597
Massachusetts:								
Essex	Haverhill	June 3	971					971
Franklin	Barnardston	do.	960					960
Hamden	Agawam	do.	976					976
Hampshire	Hadley	do.	966					966
Middlesex	Sudbury	June 4	982					982
Norfolk	Norfolk	do.	968					968
Worcester	Charleston	do.	983					983
Total	--	--	6,806					6,806
New Jersey:								
Atlantic	Egg Harbor	May 25	991					991
Bergen	Paramus	May 26	997					997
Burlington	Burlington	Apr. 20		5,994				5,994
Do.	do.	Apr. 25			18			18
Do.	do.	May 18	2,000					2,000
Do.	do.	Aug. 6			748			748
Do.	do.	Aug. 13			1,647		105	1,752
Do.	do.	Aug. 17			94		52	146
Do.	do.	Aug. 19					25	25
Do.	do.	Aug. 30				1,997		1,997

Table 7.--Liberations of European corn borer parasites in the United States in 1938, by States (Continued)

State and county	Township	Date of release	Parasite species released						Total
			Chelonus	Microbracon	Macrocentrus	Phaeogenes	Inareolata		
			annulipes	brevicornis	elfuensis	nigrifrons	punctatoria		
New Jersey, cont'd.									
Mercer	Washington	May 28	996	---	---	---	---	---	996
Middlesex	Monroe	do.	1,000	---	---	---	---	---	1,000
Monmouth	Atlantic	Apr. 25	---	5,863	---	---	---	---	5,863
Do.	do.	Aug. 31	---	---	---	1,989	---	---	1,989
Ocean	Brick	May 25	996	---	---	---	---	---	996
Total	---	---	6,980	11,857	2,489	4,004	182	25,512	
New York:									
Suffolk	Riverhead	May 9	---	4,971	---	---	---	---	4,971
Do.	do.	26	999	---	---	---	---	---	999
Total	---	---	999	4,971	---	---	---	---	5,970
Ohio:									
Lucas	Adams	June 14	1,000	---	---	---	---	---	1,000
Do.	do.	25	538	---	---	---	---	---	538
Total	---	---	1,538	---	---	---	---	---	1,538
Vermont:									
Berlington	Arlington	June 14	998	---	---	---	---	---	998
Chittenden	Essex	25	996	---	---	---	---	---	996
Grand Isle	Grand Isle	25	995	---	---	---	---	---	995
Rutland	Poultney	14	1,000	---	---	---	---	---	1,000
Washington	Middlesex	25	997	---	---	---	---	---	997
Windham	Jamaica	14	999	---	---	---	---	---	999
Windsor	Bridgewater	15	997	---	---	---	---	---	997
Total	---	---	6,982	---	---	---	---	---	6,982
Virginia:									
Accomac	Lee	March 24	---	3,186	---	---	---	---	3,186
Northampton	Franktown	31	---	2,971	---	---	---	---	2,971
Total	---	---	---	5,157	---	---	---	---	5,157
Grand total	---	---	28,257	28,553	2,489	4,004	182	63,485	

Table 8. Total releases of imported parasites in the United States to December 31, 1938

State	Apanteles sp.	Apanteles Oriental	Apanteles thompsoni Lyle	European	Bracon atricornis (Smith) 1/	Campoplex multi-	Cinctus Grav.	Campoplex pyran-	stae Smith	Chelonus annul-	ipes Wesm.	Cremastus flavoor-	Bulimneria alkoe	Eulophus viri-	Exeristes robo-	Inareolata punc-	Lydeia stabulans
Connecticut	---	---	21,268	12	---	---	---	1	6,381	1,483	1,057	17,200	---	---	---	6,882	42,723
Illinois	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2,302	---	---
Indiana	---	---	5,700	---	---	---	---	---	---	2,259	---	---	5,161	6,671	22,905	6,588	25,335
Maine	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1,927
Maryland	---	---	---	---	---	---	---	---	---	1,981	---	---	---	---	---	---	5,365
Massachusetts	388	---	69,144	127	1,129	1,697	16,010	6,762	28,526	84,786	54,957	30,938	92,087	---	---	---	---
Michigan	---	---	34,837	---	---	---	6,363	---	24,075	44,037	86,607	11,987	121,219	---	---	---	---
New Hampshire	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	593	5,569
New Jersey	---	---	---	---	---	---	7,430	1,192	---	---	---	---	---	---	---	1,925	7,541
New York	3	---	51,106	---	61	16	5,782	1,109	9,279	55,755	40,050	16,545	122,153	---	---	---	---
Ohio	---	---	52,505	---	357	38	29,705	5,145	36,398	101,648	87,826	44,065	217,448	---	---	---	---
Pennsylvania	---	---	5,774	---	---	---	---	---	550	---	20,115	707	11,588	---	---	---	---
Rhode Island	---	---	11,756	211	123	47	7,523	1,014	4,636	7,446	---	---	---	---	---	---	---
Vermont	---	---	---	---	---	---	6,982	---	---	---	---	---	---	---	---	---	---
Virginia	---	---	---	---	---	---	10,777	2,971	---	---	---	---	---	---	---	---	---
Total	391	---	252,090	350	1,670	1,799	92,193	19,676	109,682	317,543	314,766	138,759	702,017	---	---	---	---

1/ European and Oriental material.

2/ European, Oriental, and domestic material.

Table 8.--Total releases of imported parasites in the United States to December 31, 1938 (Continued)

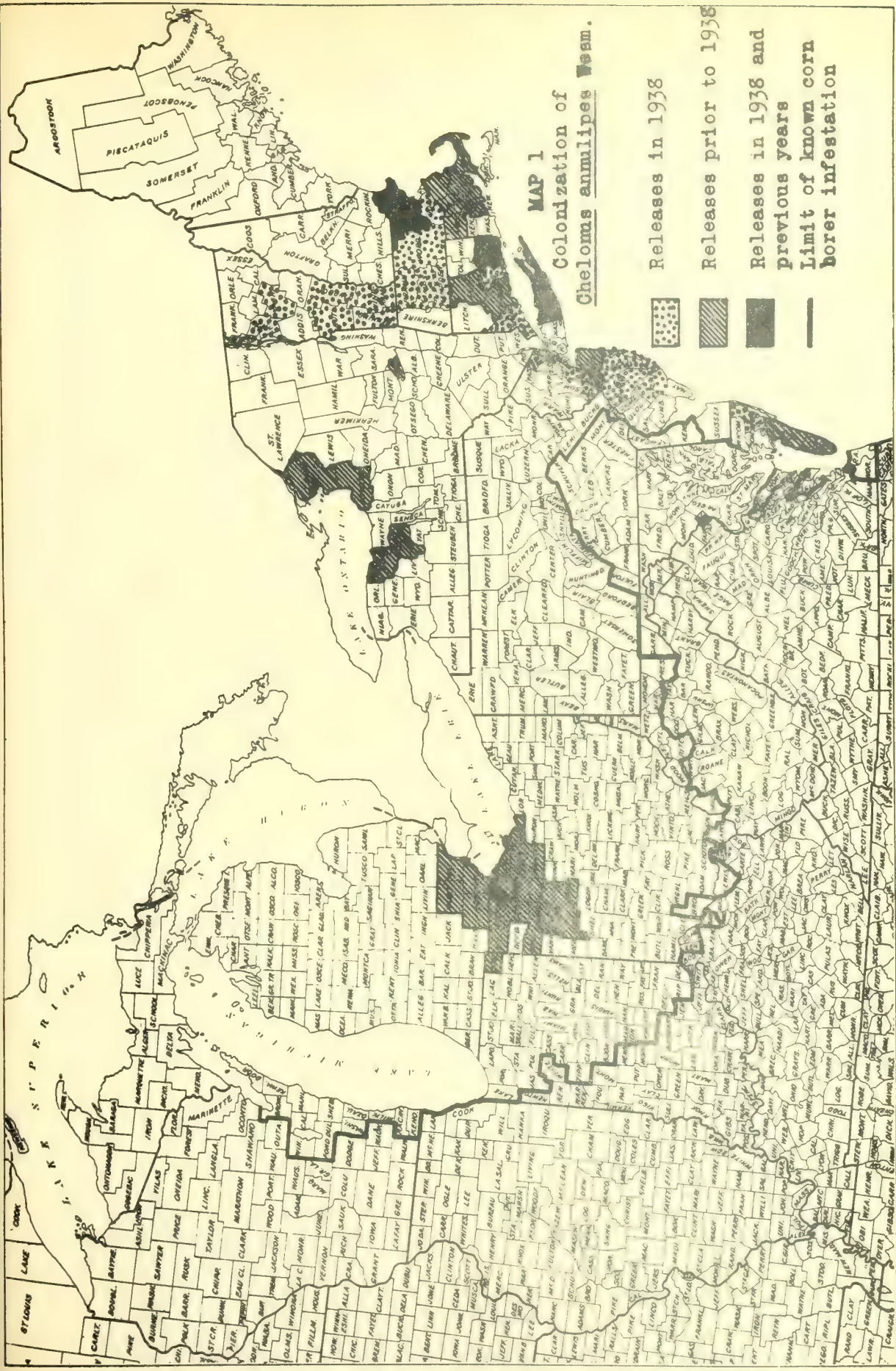
State	Macrocentrus gifuensis Ashm. ^{1/}	Meteorus nigricollis Thoms.	Microbracon brevis- cornis Wesm.	Microgaster tibialis ^{1/}	Nemorilla floralis Fall.	Phaeogenes nigridens Wesm. ^{1/}	Phorocera erecta Coq.	Zenillia mitis Meig.	Zenillia roseanae B. B.	Total
Connecticut	3,036		4,952	7,101	533	1,620	193	172	5,474	125,094
Illinois			3,635							5,937
Indiana	4,416		105,109	8,985				8	8,526	201,663
Maine			1,616							1,927
Maryland			1,084,590	84,689	371	21,885	344	514	64,755	1,714,820
Massachusetts	70,621		534,334	81,747		3,933		395	17,896	1,008,220
Michigan	40,790									6,162
New Hampshire										38,247
New Jersey	2,489		11,857	1,809		4,004				758,712
New York	37,657		354,265	34,752		569	4	463	29,743	1,468,190
Ohio	132,241		587,583	132,585	843	3,306	499	1,664	32,334	186,064
Pennsylvania	9,006		127,311	6,842		347		20	3,800	157,113
Rhode Island	33,214			19,740		12,037		188	9,305	19,074
Vermont										27,733
Virginia			5,157	3,199						
Total	337,870	8	2,820,409	387,449	1,747	52,701	1,540	3,430	171,533	5,727,923

^{1/} Includes adults from European and Oriental sources.

A second objective of the 1938 season was the testing of the larval parasite Microbracon brevicornis in the Eastern States with particular emphasis on the area south of New York City, where the winter storage of cornstalks in ricks is a general practice. These ricks support a large population of overwintering corn borer larvae and afford a source of borer infestation in the spring. Seven colonies, totaling 28,553 adults of Microbracon brevicornis, were released in 1938.

Eighteen adult females of Phaeogenes nigridens, held in cold storage over winter from material imported from Italy in the fall of 1937, were released in April 1938, when the first pupae of the season were available in the field. In addition, a large consignment of this parasite was received from Italy late in August 1938 and 3,986 adults, including both males and females, were released in New Jersey, bringing the total number liberated in 1938 to 4,004.

A total of 2,489 Macrocentrus gifuensis and 182 adults of Inareolata punctoria, available from domestic sources, were utilized to further the distribution of these parasites in previously uncolonized areas.



MAP 1

Colonization of
Chelonus annulipes Wesm.

Releases in 1938

Releases prior to 1938

Releases in 1938 and
previous years

Limit of known corn
borer infestation

INSECT PEST SURVEY BULLETIN

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SPREAD OF ALFALFA WEEVIL IN 1938

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Although scouting for alfalfa weevil during 1938 was again limited by available personnel and funds, the combined efforts of State and Federal workers resulted in discovery of infestations in 12 counties not hitherto known to be infested, distributed among 5 States (table 1). Details of this season's scouting by the personnel of the alfalfa weevil laboratory are summarized in table 2, showing 108,410 sweeps of an insect net taken in 226 fields located in 45 counties distributed among 8 Western States. Table 3 presents results of sweeping conducted in counties heretofore found infested.

Table 1.—Counties found infested by alfalfa weevil, 1938

State	County
Colorado	Pitkin ^{1/} San Miguel ^{1/} Weld
Montana	Big Horn
Nebraska	Banner ^{2/} Kinball ^{2/}
Oregon	Douglas
Wyoming	Big Horn ^{3/} Hot Springs ^{3/} Laramie Park ^{4/} Washakie ^{3/}

- ^{1/} Reported by J. H. Newton, of the Colorado department of agriculture.
- ^{2/} Reported by the Bureau of Entomology and Plant Quarantine, in cooperation with L. M. Gats, of the Nebraska department of agriculture and inspection.
- ^{3/} Reported by the Bureau of Entomology and Plant Quarantine, in cooperation with C. L. Corkins and Margaret Greenwald, Wyoming State entomologist's office.
- ^{4/} Reported by C. L. Corkins, Wyoming State entomologist.

Table 2.—Detailed results of alfalfa weevil scouting, 1938

State	County	Fields:	Total	Weevils found:		Fields
		swept	sweeps	Larvae	Adults	infested
		Number	Number	Number	Number	Number
California	Amador 1/	2	1,500	0	0	--
	Butte	7	3,500	0	0	--
	Calaveras	2/0	--	--	--	--
	Colusa	7	3,500	0	0	--
	Eldorado	2/0	--	--	--	--
	Fresno	8	3,400	0	0	--
	Glenn	6	3,000	0	0	--
	Humboldt	2	1,000	0	0	--
	Kings	3	1,250	0	0	--
	Lake	5	2,500	0	0	--
	Madera	8	4,250	0	0	--
	Mariposa	2/0	4,250	0	0	--
	Nevada	2/0	--	--	--	--
	Placer	1	500	0	0	--
	Sacramento	10	5,500	0	0	--
	San Benito 1/	3	1,000	0	0	--
	Shasta	10	5,000	0	0	--
	Siskiyou	6	3,000	0	0	--
	Solano 2/	9	5,000	0	0	--
	Sutter	5	2,500	0	0	--
	Tehama	9	4,500	0	0	--
	Trinity	2/2	1,000	0	0	--
	Tuolumne	2/0	--	--	--	--
	Yolo 3/	11	7,500	0	0	--
	Yuba	4	2,000	0	0	--
Colorado 4/	Weld	4	3,000	4	0	1
Montana	Big Horn	5	2,650	7	0	1
	Carbon	1	1,000	0	0	--
	Carter	1	400	0	0	--
	Powder River	4	2,000	0	0	--
	Yellowstone	2	1,500	0	0	--
Nebraska 5/	Banner	4	2,275	7	0	2
	Cheyenne	1	300	0	0	--
	Kimball	3	2,050	5	0	1
	Morrill	7	3,300	0	0	--
	Scottsbluff	11	4,375	121	3	6
New Mexico 6/	San Juan	--	--	--	--	--

Table 2.—Detailed results of alfalfa weevil scouting, 1938 (Cont'd.)

State	County	:Fields:Total :		:Weevils found:			:Fields	
		:swept :		:sweeps:		:Larvae:Adults:		:infested
		:Number:	:Number:	:Number:	:Number:	:Number:	:Number:	
Oregon	:Douglas	: 9	: 4,200:	2	:	0	:	2
	:Klamath	: 11	: 5,500:	0	:	0	:	--
	:	:	:	:	:	:	:	:
South Dakota	:Butte	: 3	: 1,800:	0	:	0	:	--
	:Lawrence	: 3	: 1,350:	0	:	0	:	--
	:Meade	: 2	: 1,175:	0	:	0	:	--
	:Pennington	: 3	: 1,250:	0	:	0	:	--
	:Shannon	: 2	: 350:	0	:	0	:	--
Wyoming 1/	:	:	:	:	:	:	:	:
	:Albany	: 3	: 1,250:	0	:	0	:	--
	:Big Horn	: 7	: 2,250:	Many	:	Several	:	4
	:Crook	: 2	: 1,150:	0	:	0	:	--
	:Hot Springs	: 4	: 70:	Many	:	Several	:	4
	:Laramie	: 1	: 600:	4	:	0	:	1
	:Washakie	: 3	: 90:	Many	:	1	:	3

- 1/ In cooperation with A. E. Michelbacher, of the University of California.
- 2/ No alfalfa found in county.
- 3/ In cooperation with M. L. Jones, of the California department of agriculture.
- 4/ J. H. Newton, of the Colorado department of agriculture, found alfalfa weevil in San Miguel and Pitkin Counties and scouted with negative results the following Colorado counties: Adams, Alamosa, Arapahoe, Boulder, Crowley, Denver, Dolores, Douglas, El Paso, Fremont, Huerfano, Jefferson, La Plata, Larimer, Morgan, Pueblo, Rio Grande, Weld.
- 5/ In cooperation with L. M. Gates, of the Nebraska department of agriculture and inspection.
- 6/ No scouting by alfalfa weevil laboratory but J. R. Eyer, entomologist of New Mexico Experiment Station, reports that a careful survey for alfalfa weevil was made during 1938 near Aztec, in San Juan County, with negative results.
- 1/ Margaret Greenwald, of the Wyoming State entomologist's office, found alfalfa weevil in Park County, Wyo., and cooperated with the Bureau of Entomology and Plant Quarantine in scouting Big Horn, Hot Springs, and Washakie Counties.

Table 3.—Sweeping alfalfa fields in counties previously reported infested by alfalfa weevil, 1938

State	County	Fields:	Sweeps:	Result
		Number:	Number:	
California ^{1/}	: Alameda	: --	: --	: Occurrence verified
	: Contra Costa	: --	: --	: Weevil not found
	: Merced	: 8	: 7,500	: Do. ^{1/}
	: San Joaquin	: --	: --	: Occurrence verified..
	: Santa Clara	: --	: --	: Do.
	: Stanislaus	: 3	: --	: Do.
Colorado ^{2/}	: Montezuma	: 22	: 11,475	: Do.
Nebraska ^{3/}	: Box Butte	: 3	: 2,750	: Do.
	: Dawes	: 1	: 700	: Weevil not found
Nevada	: Clark	: 23	: 31,500	: Do.
Oregon	: Josephine	: 9	: 3,300	: Occurrence verified ^{4/}

^{1/}In cooperation with A. E. Michelbacher, of the University of California, except Merced County, in which State employees verified alfalfa weevil occurrence.

^{2/}J. H. Newton, of the Colorado department of agriculture, also swept in Montezuma, Eagle, Gunnison, and Routt Counties.

^{3/}In cooperation with L. M. Gates, of the Nebraska department of agriculture and inspection.

^{4/}Weevil also found in southern part of county.

RELATIVE ABUNDANCE OF THE EUROPEAN CORN BORER IN 1938^{1/}

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The relative abundance of the European corn borer (Pyrausta nubilalis (Hbn.)) in 1938 in several representative sections of the territory infested was determined by field surveys. Data on the status of the borer in corn generally was obtained in the fall by surveying fields selected at random over a wide area, whereas that on infestation in early market sweet corn was obtained by summer examinations of the earliest and most severely attacked fields in local sections of the country. Potato fields selected at random in three of the Eastern States were also surveyed for infestation by the first generation of the borer. In each case field methods tested in previous years were used.

For the fourth consecutive year since 1934, when a significant decrease in its abundance from 1933 occurred, the European corn borer has increased in numbers over an area west of Lake Erie comprising 6 counties in Michigan and 12 in Ohio. Comparative data on abundance of the borer in this area over a 12-year period are summarized in table 1. It should be noted that, in addition to the fluctuations just mentioned, a significant decrease had occurred in 1930, followed by an appreciable increase in 1931.

^{1/} Data on corn borer abundance in Indiana became available through cooperation with the State Conservation Department of Indiana, which in 1938 conducted an extensive survey of most of the infested territory in that State.

Table 1.---A 12-year comparison of average European corn borer populations in 18 comparable counties^{1/} of Michigan and Ohio, 1927-38

: Average borers		: Average borers	
Year	: per 100 plants ^{2/}	Year	: per 100 plants ^{2/}
	<u>Number</u>		<u>Number</u>
1927 -----:	21.3	:: 1933 -----:	45.5
1928 -----:	17.1	:: 1934 -----:	+15.6
1929 -----:	32.7	:: 1935 -----:	+42.4
1930 -----:	+17.3	:: 1936 -----:	+69.9
1931 -----:	+40.7	:: 1937 -----:	+99.0
1932 -----:	48.6	:: 1938 -----:	+129.5

^{1/} The counties involved are the same as those surveyed in Michigan and Ohio in 1938 and listed in table 2.

^{2/} +Indicates significant decrease; +indicates significant increase.

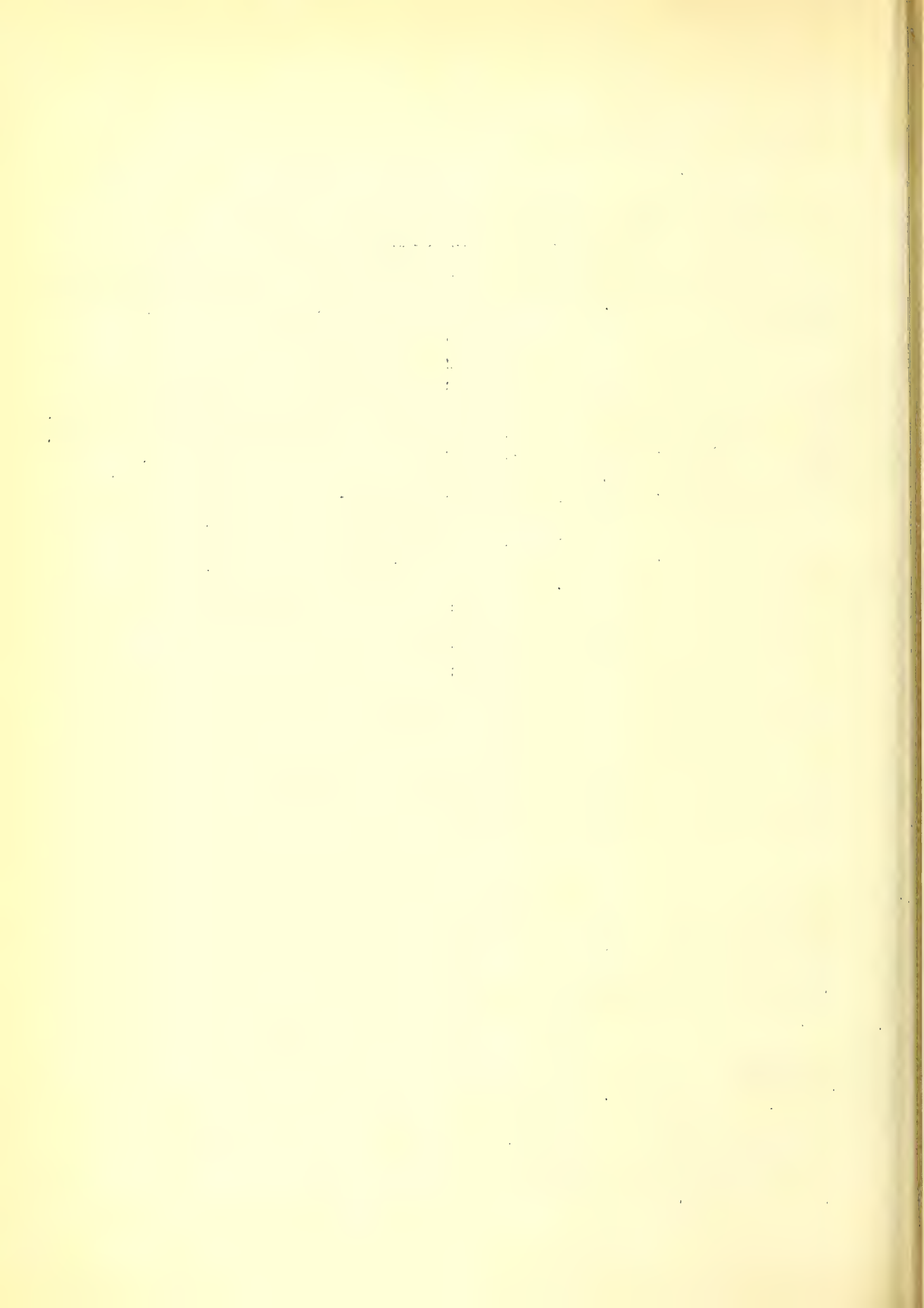
The data obtained in the 1938 fall survey are presented in table 2, together with comparable data for 1937. The most important features characterizing the known abundance of the European corn borer in 1938, as determined by this survey, may be summarized briefly as follows:

- (1) An increase of corn borer populations in the counties of Williams, Defiance, Paulding, Fulton, Henry, and Hancock, in northwestern Ohio, to number above any previously recorded in that section of the State.
- (2) The maintenance of borer abundance at approximately the same level as in 1937 in the Ohio counties of Lucas, Wood, Putnam, Seneca, and Sandusky, and a decrease from 1937 in Ottawa County, Ohio.
- (3) A significant decrease from 1937 in the counties of St. Clair, Wayne and Monroe, in southeastern Michigan, with no change in Macomb, Washtenaw, and Lenawee Counties, Mich. However, toward the southwestern portion of the Michigan section, in Lenawee County, the occurrence of highly infested fields was more general than in other years of survey.
- (4) An increase of a character similar to that in northwestern Ohio extending westward into 10 counties of northeastern Indiana, where populations were higher than found in any previous survey in this region, and the more extensive occurrence of the borer over most of the remaining territory infested in that State.
- (5) The presence of higher infestations than in previous years in the county groups of Jefferson-Oswego and Chautauqua-Erie-Niagara in western New York.
- (6) A rapid rise in infestation by the second generation of the borer in central New Jersey resulting in some of the highest populations in field corn yet observed in the United States, with notable increases over 1937 in Monmouth, Middlesex, and Burlington Counties.

Table 2.--Abundance of the European corn borer in the fall of 1938 as compared with 1937

State and County			Average borers per 100 plants in--			State and County			Average borers per 100 plants in--		
			: 1937 : 1938						: 1937 : 1938		
			Number	Number	::				Number	Number	::
Lake States						Eastern States					
Michigan						Connecticut					
Lenawee-----			147.9	206.4	::	Hartford-----			1077.2	1130.3	::
Macomb-----			178.6	191.2	::	New Haven-----			845.5	842.3	::
Monroe-----			215.9	124.8	::	District average--			961.4	986.3	::
St. Clair-----			157.7	74.4	::						::
Washtenaw-----			75.4	73.2	::	New Jersey					::
Wayne-----			131.0	65.9	::	Monmouth-----			157.4	914.9	::
District average---			151.1	122.7	::	Middlesex-----			38.1	536.1	::
						Burlington-----			86.0	818.3	::
Ohio						Mercer-----			--	639.7	::
Defiance-----			27.5	190.7	::	Camden-Gloucester---			--	97.4	::
Fulton-----			67.1	272.3	::	District average-2/			93.8	756.4	::
Hancock-----			66.8	127.9	::						::
Henry-----			66.4	188.8	::	Delaware					::
Lucas-----			149.4	212.3	::	Sussex-----			5.9	7.9	::
Ottawa-----			99.9	41.6	::						::
Paulding-----			31.4	77.1	::	Maryland					::
Putnam-----			45.7	40.2	::	Wicomico-Worcester--			11.4	8.9	::
Sandusky-----			89.3	104.3	::						::
Seneca-----			101.8	81.8	::	Virginia					::
Williams-----			33.1	136.5	::	Accomac-Northampton-			73.1	10.8	::
Wood-----			96.4	122.3	::						::
District average---			72.9	133.0	::						::
Indiana											
Adams-Blackford-											
Jay-Wells-----			4.4	65.9	::						
Allen-DeKalb-Steuben-			8.5	65.5	::						
Huntington-Noble-					::						
Whitley-----			3.1	15.8	::						
District average			5.3	49.1	::						
New York											
Jefferson-Oswego			21.2	215.6	::						
Chautauqua-Erie-					::						
Niagara-----			--	91.2	::						
District average---			--	153.4	::						

2/ Based on first three counties.



(7) The continuance of the 1937 high levels of borer population in Hartford and New Haven Counties, Conn.

(8) A decrease from 1937 in numbers of the borer on the Eastern Shore of Virginia, with no significant change in the status of the insect in southern Delaware and the Wicomico-Worcester County section of the Eastern Shore of Maryland.

In 1938 early market sweet corn was severely damaged by the corn borer west of Toledo, in Lucas County, Ohio; near Sandusky, in Erie and Huron Counties, Ohio; and in the vicinity of New Haven, in New Haven County, Conn. Lighter infestations were observed in localities surveyed in Wayne County, Mich., Cuyahoga and Lorain Counties, Ohio, and the "Beverly district" in Burlington County, N. J. The relative abundance of the insect in this crop within the localities surveyed in 1938 and in the years 1934 to 1937, inclusive, are given in table 3. Corn borer infestation in early sweet corn plants near Toledo, Ohio, increasing each year since 1934, was practically 100 percent in 1938, with an average of 17.5 borers per plant in the 25 fields examined. In New Haven, Conn., sweet corn in the 25 early fields observed in 1938 was infested with an average of 8.8 borers per plant.

Table 3.—Abundance of the European corn borer in early market sweet corn in localities surveyed from 1934 to 1938^{1/}

State and county	Average borers per 100 plants in—		
	1934	1935	1938
	Number	Number	Number
Connecticut:			
New Haven -----	521 (21)	675	873
Hartford -----	446	225	--
Massachusetts:			
Middlesex -----	180 (14)	288	--
Bristol -----	135	--	--
Rhode Island:			
Newport-Bristol -----	175 (28)	385	--
Maine:			
York -----	--	117	--
New York:			
Suffolk -----	21 (11)	145 (20)	--
Nassau -----	9 (15)	--	--
Monroe -----	130 (29)	64	--
Orleans -----	126 (27)	--	--
Chautauqua -----	79	--	--
Jefferson -----	70	--	--
Wayne -----	--	112	--
New Jersey:			
Monmouth-Ocean -----	--	25	--
Burlington -----	--	--	50 (21)
Ohio: ^{2/}			
Lucas -----	268 (15)	328	1,751
Erie-Huron -----	--	--	1,128 (8)
Cuyahoga-Lorain -----	--	--	66 (10)
Michigan:			
Wayne -----	--	9 (20)	285 (10)

^{1/} Except as indicated otherwise by the figures given within parentheses, 25 fields were surveyed to obtain each population average. In each case the survey was confined to the earliest fields of sweet corn that could be found within a given locality.

^{2/} The average numbers of borers per 100 plants in this county in 1936 and 1937 were 469 and 794, respectively. No other localities were surveyed in these 2 years.

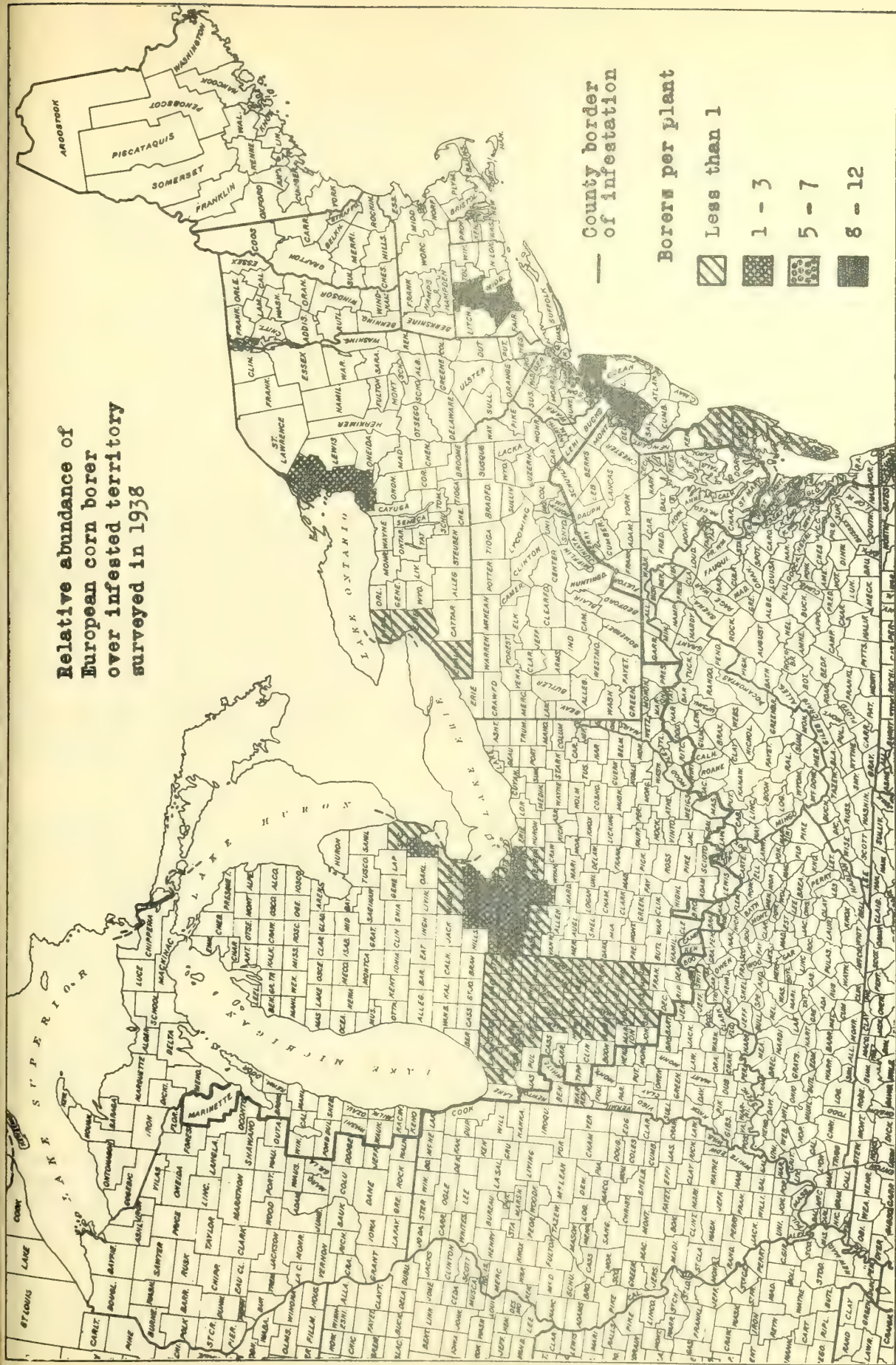
Increased infestation over that of 1937 of the first generation in white potatoes occurred in central Connecticut and west-central Massachusetts, with a decrease in abundance in this host plant on eastern Long Island, N. Y. In Connecticut the average number of borers per 100 plants in 1938 was 358, as compared with 106 in 1937; whereas in Massachusetts the average in 1938 was 280, as compared with 74 in 1937. On Long Island the decrease was from an average of 60 borers per 100 plants in 1937 to 30 in 1938.

Favorable weather for the corn borer prevailed in the Lake States in 1938, with adequate and well-distributed moisture in the field during the critical stages of the insect's development. Considerable corn in northwestern Ohio was planted late and was only lightly infested by the borer. In central New Jersey meteorological factors operated to the advantage of the second-generation borer and seasonal conditions in New England were generally favorable. Floods and a hurricane in the latter region, however, made necessary the abandonment of the fall survey in Massachusetts, although observations indicate that no direct effects on prevailing borer populations were associated with the storm. Weather extremes of drought and excessive precipitation during oviposition periods of the borer are believed to be responsible for the low populations recorded in Delaware, Maryland, and Virginia in 1938.

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Relative abundance of European corn borer over infested territory surveyed in 1938



County border of infestation

Borers per plant

Less than 1

1 - 3

5 - 7

8 - 12



THE FIELD STATUS OF PARASITES OF THE EUROPEAN CORN BORER
IN THE FALL OF 1937

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Surveys were conducted after the active season of 1937 both in the Lake States and in the Eastern States in order to determine the current status of parasites of the European corn borer, with special emphasis on species that have been imported and released at various localities in the infested area. The field collecting of material for subsequent laboratory handling was restricted to localities in the vicinity of points previously selected for testing the reaction of parasites to environments in the United States. Each of the surveyed localities was sampled by the section-random sampling method, the location of samples being determined by the use of polar coordinate or transect designs of a type suitable to the objectives sought at each point.

In the Lake States area collections were made at 5 colony sites, and a special survey was made along the western shore of Lake Erie, including part of the Maumee River Valley, to determine the dispersion of the tachinid parasite Lydella stabulans grisescens R. D. from the Jerusalem Township, Lucas County, colonization point in Ohio and the Monroe and Erie Township, Monroe County, points in Michigan. One hundred eighty-one samples, averaging 81.6 borers each, or a total of 15,666 larvae, were collected at the various survey points.

In the Eastern States surveys were made at the following points: Malden, in Middlesex County, and Taunton, in Bristol County, Mass.; East Hartford, in Hartford County, Conn.; Atlantic Township, in Monmouth County, N. J.; and Lee District, in Accomac County, Va.

Three hundred eighty-six samples, averaging 97.8 borers each, or a total of 37,736 larvae, were collected at the various survey points in both areas. The results of observations in the two areas are summarized in tables 1 and 2.

* Includes Panzeria penitatis Coq., Zenillia caesar Ald., Labrorychnus prismaticus Nort., and Bassus agilis Cress.

Table 2.--Summary - Parasites recovered in the Eastern States area in the fall of 1937

[illegible]

* / No release of this parasite at point indicated.

Statue of Parasites as Determined by the 1937 Surveys

Lydella stabulans grisescens R. D.--This tachinid parasite was of primary importance in the Lake States area at all points adjacent to Lake Erie. In Jerusalem Township, Lucas County, Ohio, where the parasite has been present for 8 years, the 1937 survey showed that the area from which it was recoverable had extended considerably to the south and east. Samples from five of the fields examined at this point showed parasitization percentages of 69.2, 61.0, 50.5, 48.4, and 41.7, respectively.

Table 3.--Annual fall parasitization by Lydella grisescens about the Jerusalem Township, Lucas County, Ohio, release point

Year	Parasitization within radius of release	
	3 $\frac{1}{2}$ miles	7 $\frac{1}{2}$ miles
	Percent	Percent
1932-----:	0.3	--
1933-----:	2.8	--
1934-----:	6.3	--
1935-----:	7.6	4.4
1936-----:	10.0	7.0
1937-----:	22.5	9.6

The progressive increase in parasitization, as shown by table 3, indicates that Lydella grisescens did not reach equilibrium previous to 1937, even within the 3 $\frac{1}{2}$ mile radius of the release point. The parasitization within the continuously parasitized area at the Jerusalem colony site amounted to 20 percent. This is the highest parasitization recorded at any point in either area and indicates an environment particularly favorable to the development of the species.

In Erie Township, Monroe County, Mich., and in Perkins Township, Erie County, Ohio, two of the oldest colony sites in the Lake States area, the parasitization by Lydella grisescens showed a remarkable increase in 1937 over that of 1936, the percentage of increase at the two points being 68.6 and 918.3, respectively. Observations designed to determine the distribution of this tachinid in the Maumee River Valley and northward into Michigan along the western shore of Lake Erie over an area 20 miles long and 9 miles wide, showed L. grisescens to be present and in greater abundance in all the quadrates in the vicinity of marshland bordering the lake or streams within the area observed. With one exception Lydella was not found at a greater distance than 4 miles from the lake shore (see map 1).

This imported tachinid was recovered from all five of the regions in which host collections were made in the East. It occurred in maximum abundance in a restricted area extending northeasterly in the vicinity of Taunton, Mass. Parasitizations of about 15 percent occurred in samples taken between Taunton and Fall River, Mass. L. grisescens was known to be present at the close of 1937 in a territory totaling over 837 square miles in the Eastern States area.

Inareolata punctoria Roman.--A single specimen of this ichneumonid parasite was recovered near the Erie Township, Monroe County, Mich., colony site, at a point where it has been taken for 5 consecutive years. In the East, however, this parasite was generally dispersed in the vicinity of Boston, in southeastern Massachusetts, and around the colony site near Hartford, Conn. It was found to be present over an area of 524 square miles in the Boston area, with several collections from this area showing parasitization of over 10 percent and one of 17.3 percent. I. punctoria was present throughout the area within 12 miles of Taunton, Mass., covering an area of 226 square miles, with parasitization as high as 10 percent (see map 2).

In the East Hartford, Conn., area this parasite has increased very rapidly in abundance and in the extent of its distribution since 1936. Released at this point in 1934, at the close of 1937 it covered about 15 square miles and was recovered from 19 of the 26 collections made. One collection yielded 23 parasites, or 24.5-percent parasitization. This larval parasite was recovered from one section at Atlantic, N. J., but was not recovered from the Lee, Va., district. At the close of 1937 I. punctoria was present in an area totaling not less than 756 square miles in the infested area in the Eastern States.

Macrocentrus gifuensis Ashm.--This species was not recovered from the Malden, Mass., area but its firm establishment and continued maintenance were again confirmed for the Taunton, Mass., area. In the latter area M. gifuensis was reared from 15 separate collections obtained in a district extending over 45 miles from the vicinity of Tiverton, on Mount Hope Bay in Rhode Island, northeast as far as collections were made in the direction of Scituate, Mass. (see map 2). Since a number of scattered liberations of Macrocentrus were made in this area, its present distribution does not necessarily represent dispersion from any one point. However, it is probable, as judged by the relative abundance of the parasite in parts of the area from which it was recovered, that most, if not all, of its present distribution may be traced to the original release of 41 adults of the Oriental strain made at Bridgewater, Mass., in 1931, or to the release of 8,686 adults of the same strain at the same locality in 1932. The 1932 release was the last liberation of the species in this locality. It was not until 1936 that a parasitization as high as 20 percent was recorded. In the 1937 fall collections, the highest parasitization was 33 percent. M. gifuensis had not yet been released at the other points surveyed in 1937.

Chelonus annulipes Wesm.--The braconid parasite C. annulipes, which attacks corn borer eggs, was recorded in numbers from the Taunton, Mass., area only but here it was obtained from 12 separate collections. The parasite is concentrated within an area of approximately 75 square miles centering at Berkley (see map 2), but was also recorded at 2 other points in the Taunton area, one near the town of South Wareham about 10 miles southeast and one near Abington, almost 15 miles north of the area of high concentration. In 3 collections made in the central part of the Taunton area parasitization by this species was 13.0, 15.2, and 24.0 percent. The only other point where C. annulipes was recovered in the 1937 survey was in the Lee district of Virginia, where 2 specimens were taken in the immediate vicinity of the locations where this parasite was released in 1936 and 1937.

Cremastus flavoorbitalis (Cameron).--This species was again recovered from one section of the Taunton area, showing its continued maintenance there, but it has failed to increase to sufficient numbers to be recovered outside of a very restricted district. However, the collection from which this parasite was reared was made about 4 miles from the site where it was taken in 1936.

Phaeogenes nigridens Wesm.--A survey conducted during the summer of 1938 to determine the status of P. nigridens in eastern Massachusetts showed this imported pupal parasite to be present over an area of about 10 square miles. Collections in which the parasite appeared were made in two districts, one lying in the vicinity of Waltham, Arlington, and Lexington and the other near West Peabody and Danvers. One collection showed a parasitization of over 10 percent.

Native parasites.--Four species of native parasites, Panzeria penitalis Coq., Zenillia caesar Ald., Labrorychus prismaticus Nort., and Bassus agilis Cress., were recovered in the 1937 surveys. In no instance did the parasitization by any of these parasites average over 1 percent.

Parasite Status at Two Release Points in the Eastern Area

The Malden, Mass., area.--The parasite complex at Malden, the center of several of the oldest release points in the United States, is made up chiefly of two parasite species, Inareolata punctoria and Lydella grisescens, both introduced into the United States from Europe and the Orient. Table 4 gives a comparison of the percentages of corn borer parasitization by exotic species for comparable districts of the Malden area for the period 1927-37, inclusive.

Table 4.--Corn-borer parasitization in a comparable portion of the Malden, Mass. area, 1927-37, inclusive

Year	Parasitization	Year	Parasitization
	Percent		Percent
1927-----:	2.79	1933-----:	no data
1928-----:	5.17	1934-----:	14.53
1929-----:	6.87	1935-----:	16.11
1930-----:	9.67	1936-----:	14.05
1931-----:	9.87	1937-----:	9.66
1932-----:	15.16	:	

It may be noted from table 4 that there was a steady increase in parasitization of the borer from 1927 to 1932 and that for the period 1932 to 1936, inclusive, this remained more or less static at approximately 15 percent. At the close of 1937 parasitization was considerably below that for the previous 5 years and was no higher than in 1930. Data at hand indicate that the reduction in the population of parasites, as compared to host abundance, took place between the time of the 1936 survey in November of that year and a 1937 summer survey late in July and early in August. The

parasitization has always been much higher, usually at least twice as high, on the first or summer generation than on the overwintering generation. In 1937 this was not the case, the parasitization of the overwintering borers, as determined in the fall survey, being higher than in the previous summer, indicating that the parasites have already started a return toward the normal equilibrium position, believed to be approximately 15 percent for the parasite complex on the overwintering borers in this region.

It should be emphasized that the above discussion concerns only the central 154 square miles of the Malden district comparable to the area surveyed in previous years. The dispersal of the parasites has continued with the result that the region surveyed in 1936 was increased to cover a circular area 26 miles in diameter, or 531 square miles, and increased again in 1937 to cover a region 36 miles in diameter, or a territory of 1,018 square miles. The total parasitization in the 531 square miles surveyed in 1936 was found to be 14.90 percent, but in the fall of 1937 the parasitization in this same territory was only 7.95 percent, showing that the same decrease that had taken place in the central district had also occurred in this larger district. The parasitization of the corn borer in the whole Malden area of 1,018 square miles at the close of 1937 was found to average 5.44 percent.

The Taunton, Mass., area.---Prior to 1937 a number of small surveys for parasites had been conducted in southeastern Massachusetts and eastern Rhode Island. In 1934 Lydella grisescens was the only parasite recovered from survey collections made at East Providence, R. I., and Bridgewater, Mass.; however, one mass of cocoons of Macrocentrus gifuensis was found in that year in the course of other work near Bridgewater.

In the fall of 1935 a district 5 miles in diameter, or approximately $19\frac{1}{2}$ square miles in area, was surveyed at East Providence. Lydella grisescens was again recovered, as in 1934, but Inareolata punctoria was also found to be present in measurable numbers. At the Bridgewater point, collections over a district 3 miles in diameter, or about $7\frac{1}{2}$ square miles, failed to show the presence of M. gifuensis or I. punctoria, but L. grisescens was again recovered. As numerous releases of several species of parasites had been made over a period of years up to 1932 in a district extending from Taunton to Swansea, Mass., a survey of a strip 2 miles wide and 14 miles long was made in this district in 1935. In addition to revealing the presence of L. grisescens and I. punctoria, the survey also showed that Chelonus annulipes was present in considerable numbers at Dighton and Taunton.

In 1936 a survey of 78.5 square miles around Dighton showed that Chelonus annulipes was present over this territory and, from its recovery at the outer edge of this district, probably beyond the limits of the survey. Lydella grisescens and Inareolata punctoria were also found throughout this district, and Macrocentrus gifuensis was recovered in numbers from some sections. A survey at Bridgewater of a larger area than in 1935 ($19\frac{1}{2}$ square miles in 1936 as compared to $7\frac{1}{2}$ square miles in 1935) confirmed the presence of M. gifuensis, first found in 1934.

As the 1936 surveys showed Macrocentrus gifuensis at both Dighton and Bridgewater with indications that it was probably present in the territory between these points, as Chelonus annulipes was believed to be present beyond the area surveyed in 1936, and as the indications were that Lydella grisescens and Inareolata punctoria were dispersed over a considerable area, a survey of a territory 45 miles in diameter, covering an area of 1,595 square miles, extending from just south of Boston, Mass., to and including Providence, R. I., was surveyed in the fall of 1937. This territory covered almost all of southeastern Massachusetts, except Cape Cod east of the canal, as well as a part of Rhode Island, and included the districts previously surveyed separately at Bridgewater, Dighton, Taunton, and Swansea, Mass., and East Providence, R. I.

The Taunton region, as outlined above, was surveyed in 1937 by utilizing a polar coordinate design centering at Taunton, Mass. The percentage of parasitization of the borer by the exotic parasite complex, consisting of Inareolata punctoria, Lydella grisescens, Macrocentrus gifuensis, and Chelonus annulipes, decreased as the distance from the center of the survey increased. Not only was this true of the introduced parasite complex as a whole, but it was also the case with each of the four principal parasites making up that complex. Cremastus flavoorbitalis, although an introduced parasite present in this area, is still too scarce to be of importance in the parasite complex of this area. Sufficient time has not elapsed since the establishment of the parasite colonies at the remaining points surveyed in 1937 in the eastern area to allow comparative yearly studies of the parasite complex.

Summary

Surveys conducted at the close of the 1937 season showed that in the Lake States area the parasite of first importance was Lydella stabulans grisescens. It was abundant near the marshland at the southwestern shore of Lake Erie, and in this region parasitization of over 60 percent in some samples of borers was noted.

In the eastern area the most important parasite complex centered at Taunton, Mass., in which region five species of imported parasites predominated. These were Lydella stabulans grisescens, Macrocentrus gifuensis, Chelonus annulipes, Inareolata punctoria, and Cremastus flavoorbitalis, listed in order of their effectiveness, L. grisescens assuming first place because of its more general distribution.

The highest parasitization in individual fields was by C. annulipes. In the vicinity of the oldest release points in the United States, centering at Malden, Mass., Inareolata punctoria was of first importance. The pupal parasite Phaenogenes nigridens was recovered at several points in the Malden area.

Exceptionally high parasitization by Inareolata punctoria was noted at the comparatively recently established liberation point near E. Hartford, Conn.

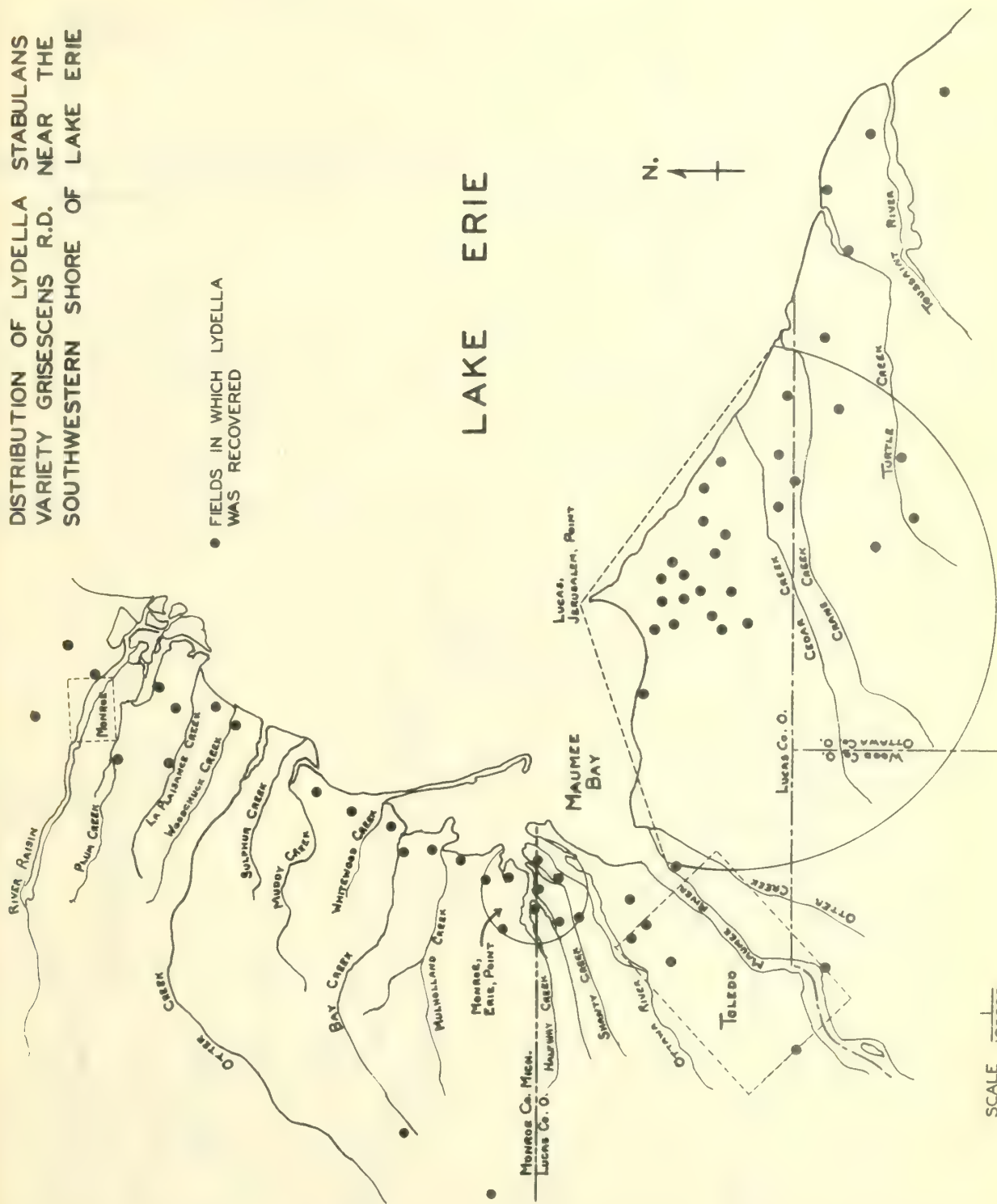
Chelonus annulipes was recovered in the Lee district in Virginia, but at this point, as well as in the Atlantic, N. J., district, parasitization was low.

MAP I

DISTRIBUTION OF LYDELLA STABULANS
VARIETY GRISESCENS R.D. NEAR THE
SOUTHWESTERN SHORE OF LAKE ERIE

• FIELDS IN WHICH LYDELLA
WAS RECOVERED

LAKE ERIE

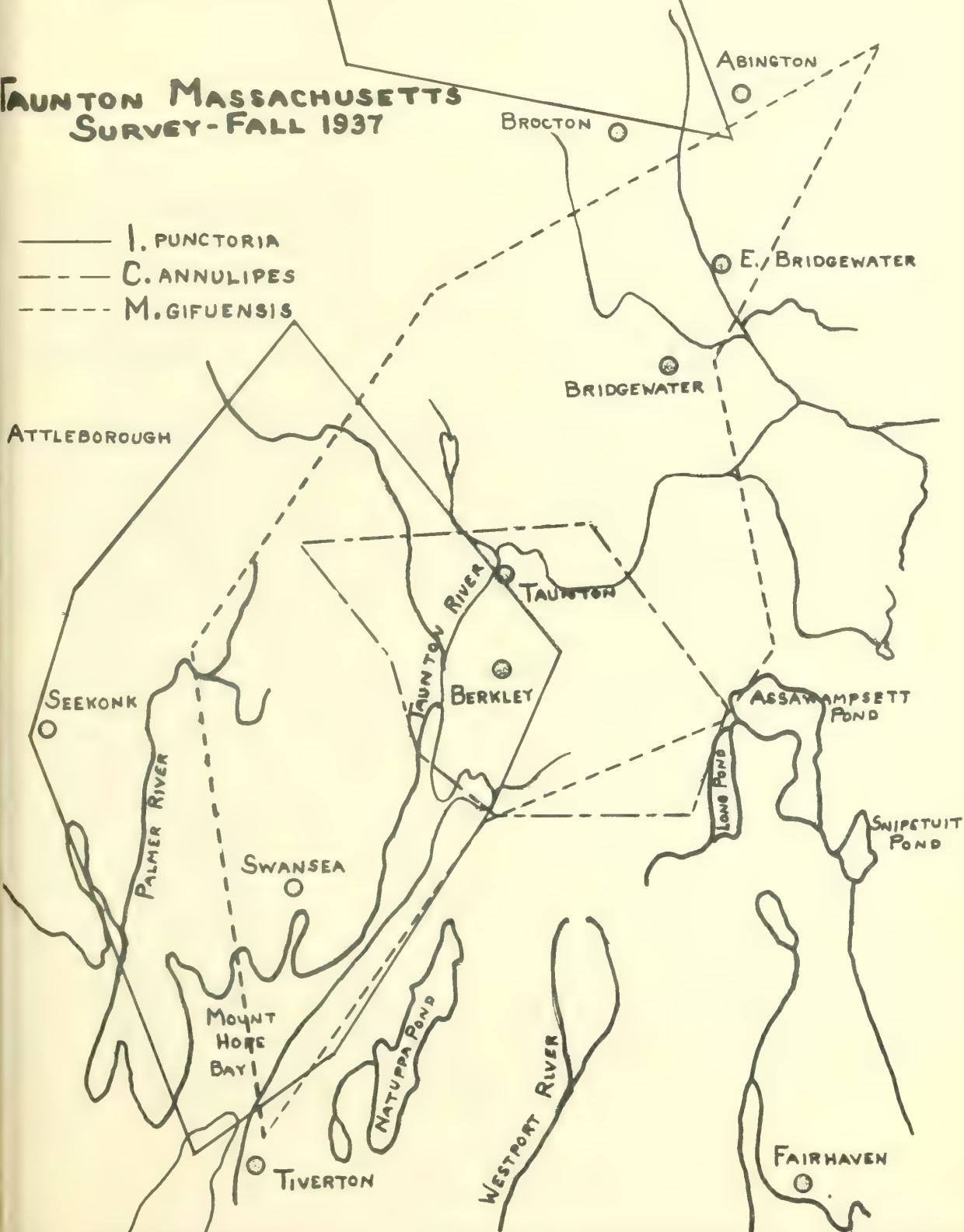


MAP 2

0 2 4 6
SCALE OF MILES

TAUNTON MASSACHUSETTS SURVEY-FALL 1937

- I. PUNCTORIA
- - - C. ANNULIPES
- - - M. GIFUENSIS



Introduction

The outstanding feature of the weather in 1938 was its abnormal warmth. For the country as a whole, it was one of the warmest years of record. The greatest abnormalities in temperature occurred in the interior of the country. The precipitation for the year in most States was also above normal. Since the recent drought years, 1938 was the second in succession with somewhat above-normal rainfall. The first half of the year was unusually wet, but the latter half brought harmful deficiencies in moisture to some midwestern sections, especially the normally drier areas of the Great Plains. The South Atlantic and Gulf areas and the northern Great Plains were relatively dry.

The winter of 1937-38 was uniformly mild throughout the country and this condition, accompanied by abundant rainfall, continued throughout the spring. However, in March the entire Atlantic coast showed a deficiency in moisture and in April dry areas occurred in scattered sections, especially in the Southwest. May did not show the decided above-normal temperature of the first part of the year, the northeastern, Middle Atlantic, and a large section of the northern Great Plains and Rocky Mountain regions being cooler than usual, brought the country as whole an average of about normal temperature. This feature was reflected in insect abundance.

The summer was characterized by relatively high temperatures and, during most of the period, by abundant rainfall. The temperature averaged above normal in all sections, except for very limited areas. With the exception of South Carolina and Florida, all States east of the Mississippi River had above-normal rainfall for the season. Between the Mississippi and the Rocky Mountains all States except Louisiana, Iowa, and Montana had below-normal rainfall. This condition existed during June in Minnesota, North Dakota, and South Dakota; however, during the first part of September the droughty conditions in most of this area were relieved by general rains. In the more western areas all States except Idaho, Wyoming, and Nevada received below-normal rainfall. The abnormal warmth continued through September. Precipitation was abnormally heavy from North Carolina northward and was also above normal over a belt from Lake Michigan southwestward to Colorado and northern New Mexico. Other parts of the country were largely deficient in precipitation. October was abnormally warm over the entire country and was extremely dry. From the Great Plains eastward it was one of the driest Octobers of record. On the other hand, the rainfall was relatively heavy in central and northern sections from the Rocky Mountains westward. The warm weather continued into a very warm fall.

The effect of the weather on insect abundance may be seen in the case of grasshoppers. The cool, rainy weather of May retarded hatching, but permitted a profusion of range grasses. In June the weather was warm and dry in western North Dakota and northwestern South Dakota, favoring the development of grasshoppers. The grasshoppers, having abundant food, rapidly reached maturity and the grasses were eaten down and dried up by the dry weather, resulting in heavy flights of grasshoppers from this area into eastern Montana, the Red River Valley, and Canada.

In its effect upon the chinch bug the season of 1938 almost duplicated that of 1937. The insect overwintered successfully but the wet, cool weather in the spring was detrimental to it, and in the fall the dry, warm weather favored increased populations and hibernating conditions.

GRASSHOPPERS

The greatest damage occurred in the northern Great Plains States in and near the overlapping zones of short and long grass and where the annual rainfall for the last 2 years has amounted to less than 20 inches. Repeated crop failure in these dry areas resulted in large acreages in reverted and idle lands. These areas bred tremendous numbers of Melanoplus mexicanus Sauss. and resulted in destruction of crops through migration of nymphs to adjoining crops and through flights of adult grasshoppers to distant fields.

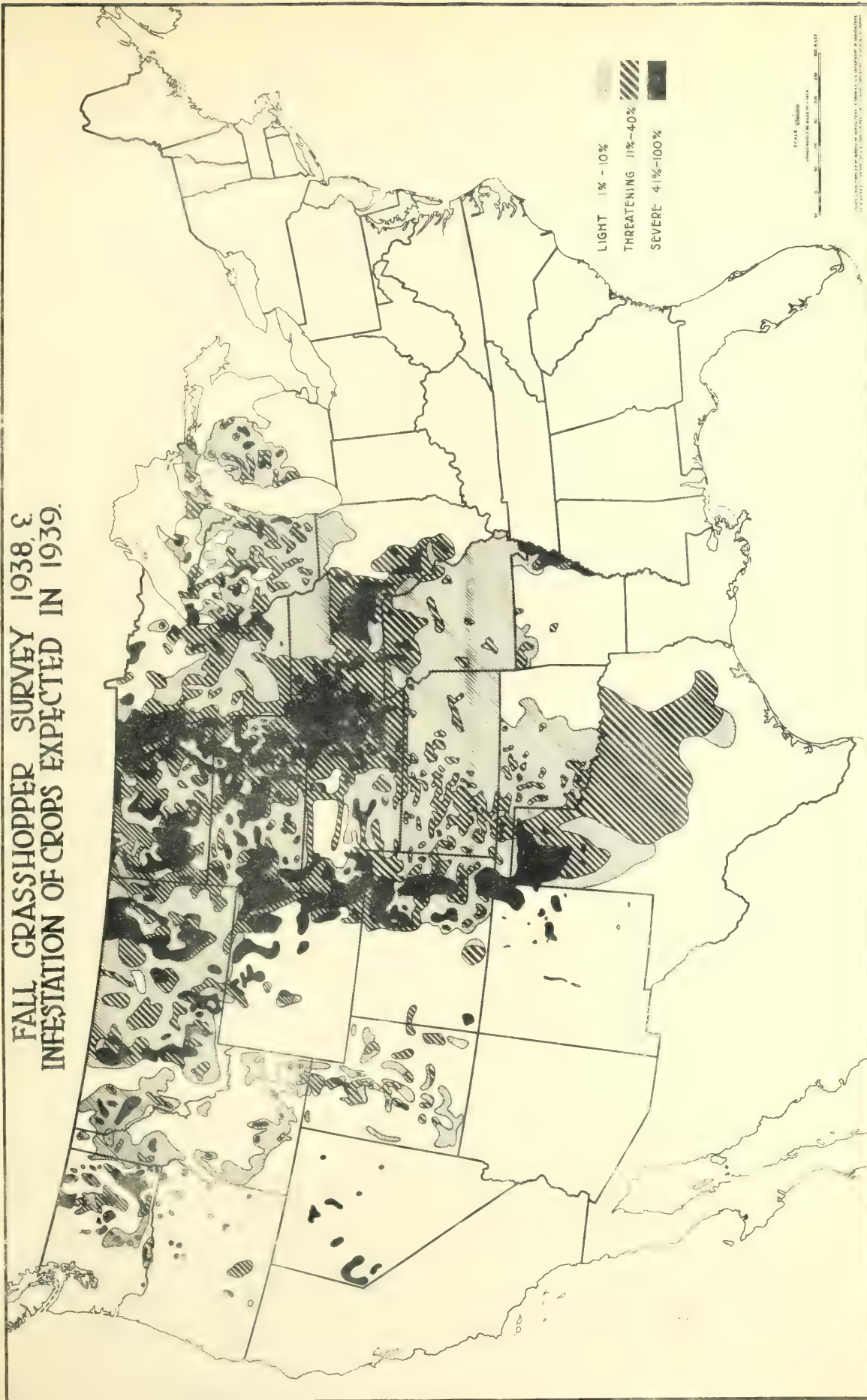
In the southwestern portion of the Great Plains area, including the southeastern counties of Colorado, the northeastern counties of New Mexico, and Panhandle counties of Texas which adjoin New Mexico, Dissoteira longipennis Thos. occurred in numbers large enough to produce flights late in the season. Very large numbers of grasshopper eggs were deposited in the fall of 1937 and hatching in the spring spread over a long period of time. The value of the crops lost amounted to \$83,841,000 and it is estimated that \$176,442,000 worth of crops were protected by control measures. The most serious damage occurred in North Dakota, South Dakota, and Nebraska, North Dakota reporting over \$24,000,000 damage and South Dakota and Nebraska each reporting over \$11,000,000 damage. Kansas and Montana each reported over \$6,000,000 damage, Wisconsin reported over \$4,000,000, Oklahoma, Missouri, and Colorado each reported over \$2,000,000 damage while Iowa, Minnesota, and Texas each reported over \$1,000,000 damage. Very severe damage also occurred in Arizona, California, Idaho, Illinois, Michigan, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

A map showing the results of the fall egg survey is included.

EUROPEAN CORN BORER

Although general scouting to determine the dispersion of the corn borer was not conducted in 1938, observations made by State personnel in Wisconsin, Indiana, and Virginia indicate that only a slight increase occurred in the total infested territory. New infestations were observed in two counties in Wisconsin and two in Virginia. No new county infestations were found in Indiana, although infestations were recorded in 1938 in a number of townships not previously reported as infested, within infested counties. A single specimen of the corn borer collected at Arlington, Va., indicates that additional dispersion had occurred in the Eastern States, although abundance levels are too low to determine its approximate extent, except by intensive scouting. In the Lake States the general

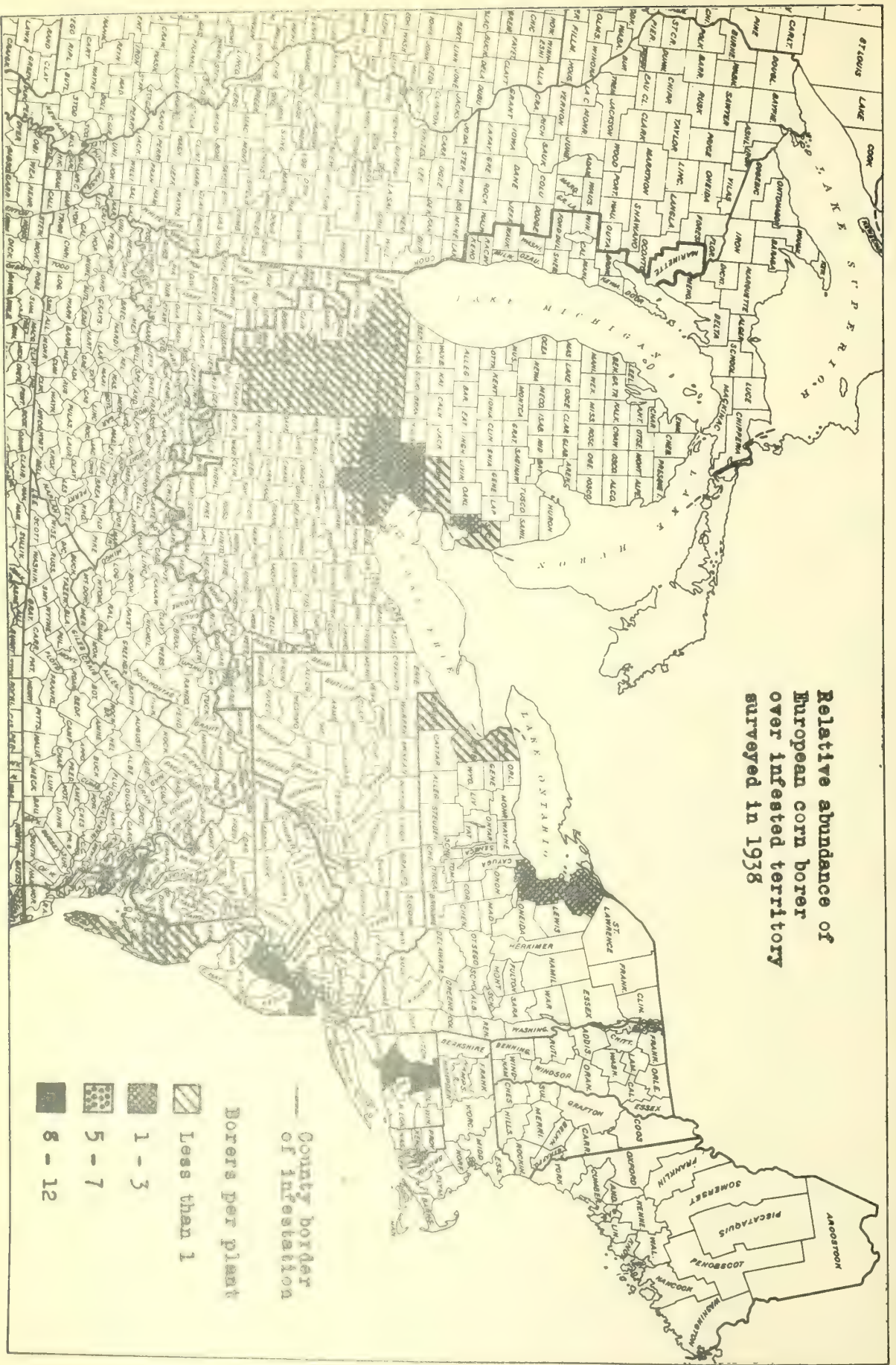
FALL GRASSHOPPER SURVEY 1938. INFESTATION OF CROPS EXPECTED IN 1939.











Relative abundance of
European corn borer
over infested territory
surveyed in 1938



County border
of infestation

Borers per plant

-  Less than 1
-  1 - 3
-  5 - 7
-  8 - 12

trend of population in 1938 showed an increase over 1937, although the average population in some counties at the western end of Lake Erie showed little change, with some decreases noted in southeastern Michigan. The average borer population in the surveyed sections of Michigan and Ohio (including principally the older infested counties of these States), following a uniform annual increase since 1934, reached the highest level recorded for this section to date. Similar conditions occurred in Indiana where, while the general borer level is low compared with older infested areas, populations were higher than found in any previous survey. Of particular significance in the Lake States was the occurrence of an infestation that averaged 17 borers per plant in early market sweet corn in the Toledo, Ohio, truck district, an increase in the occurrence of a second generation, and light infestations in crops other than corn including potatoes, peppers, and dahlias. In the Eastern States in 1938, populations of the corn borer continued at a high level in Connecticut, averaging 10 borers per plant in Hartford and New Haven Counties, and a rapid rise in infestation by the second generation of the borer in central New Jersey resulted in some of the highest populations in field corn yet observed in the United States. The population in Monmouth, Middlesex, and Mercer Counties, N. J., averaged over 7 borers per plant, with 57 percent of the fields surveyed averaging over 5 borers per plant; 21 percent averaging more than 10 borers per plant; and 4 percent averaging over 25 borers per plant. Infestation decreased sharply on the Eastern Shore of Virginia and no significant change was observed in the status of the insect in southern Delaware and the Wicomico-Worcester County section of Maryland. Populations in early market sweet corn in the New Haven, Conn., district averaged 9 borers per plant, while heavy infestation was not yet apparent in the extra early "Beverly" truck crop district in New Jersey. Increased infestations over 1937, by the first-generation borer, occurred in white potatoes in central Connecticut and west-central Massachusetts, with a decrease of the insect's abundance being observed in this crop on eastern Long Island, N. Y. Severe infestations in dahlias occurred throughout New England and southward along the Atlantic coast, including the lower Hudson River Valley, to central New Jersey. Favorable weather prevailed in the Lake States in 1938, with adequate and well-distributed moisture in the field during the critical stages of the insect's development. In central New Jersey meteorological factors were advantageous to the second-generation borer and seasonal conditions in New England were generally favorable. The occurrence of floods and a hurricane in the latter region, however, made necessary the abandonment of the fall survey in Massachusetts, although observations indicate that the storm had no direct effects on prevailing borer populations. Extremes of drought and excessive precipitation during oviposition periods of the borer contributed to the low populations in Delaware, Maryland, and Virginia. (W. A. Baker, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

HESSIAN FLY

At harvest time the surveys of wheat stubble, made by the Bureau of Entomology and Plant Quarantine field stations and cooperating State agencies, indicated that hessian fly populations were from low to moderate in Nebraska, Kansas, Oklahoma, Missouri, Illinois, the southern half of Indiana, central Ohio, Kentucky, Tennessee, western and south-central Pennsylvania, Maryland, Delaware, and Virginia. However, there were menacing populations of flies in local fields and areas in most of these States or districts. Marked increases of fly occurred throughout the northern half of Indiana and the northwestern counties of Ohio.

Slight-to-moderate increases of infestation were recorded for central Ohio, eastern and northern Pennsylvania, northwestern and south-central Virginia, and north-central North Carolina. In the wheat seeded in Pennsylvania in the fall of 1938 light-to-moderate infestations occurred in the western part, heavy infestations in the central part, and light infestations in the eastern part. Generally light infestations were found in Maryland and Delaware. For Ohio, Indiana, Illinois and Michigan volunteer wheat was moderately to heavily infested, but infestation was limited to rather isolated localities where sufficient rainfall occurred. Early sown fields of wheat showed moderate-to-heavy infestation, depending on local conditions of moisture. In general, where the safe-seeding dates were adhered to, light or no infestations were recorded. In parts of northern and central Indiana, especially where the harvest-time survey of stubble indicated a heavy infestation in prospect, many early sown wheat fields, even those seeded near the safe date, show rather severe injury, although the favorable fall weather permitted these fields to partially outgrow the damage. No damage to fall-sown wheat was reported from Kentucky and Tennessee. For Iowa, Nebraska, Kansas, Missouri, and Oklahoma the drought caused conditions unfavorable for hessian fly during the fall months. Volunteer wheat was generally absent but when occurring in localized areas it showed light-to-moderate infestations. Infestations to regular fall-seeded wheat were generally light, with damage negligible, the larger acreages of wheat having escaped infestations by delayed germination of the seed until the fly season ended. (W. B. Cartwright and Curtis Benton, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

CHINCH BUG

The threat of moderate-to-severe infestations in scattered localities from western Indiana across Illinois, southern Iowa, central and northern Missouri, into southeastern Nebraska, eastern Kansas, and northeastern Oklahoma, as indicated by numbers of bugs in hibernation at the beginning of the year, was to a large extent removed by the cold, wet spring, unfavorable to establishment and increase in the small grains. The warm, dry weather late in the summer and fall was very favorable for the maturing of the summer generation in corn and its successful establishment in winter quarters. As a result, there are many localities in which the bugs are from moderately to extremely abundant in an area extending from central Ohio across Indiana, Illinois, the southern three tiers of counties in Iowa, and north-central Missouri. While no reports are available from Kansas or northern Oklahoma, fragmentary notes have been received which indicate the presence of at least spotted infestations in southern Oklahoma and north-central Texas. Should weather conditions be favorable to the bugs next spring, moderate-to-severe local infestations may occur over a rather large area in the Central States. (C. M. Packard, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

MORMON CRICKET

It was estimated in the fall of 1937 that over 4,000,000 acres in Nevada, Utah, Idaho, Washington, Oregon, Montana, and Wyoming were infested with Mormon crickets. In the fall of 1938 the known infested area had increased to 15,900,000 acres. In 1938 infestations were found in Nebraska, North Dakota, and South Dakota. Damage to crops in 1938 amounted to over 5 percent, and damage to range amounted to 14 percent. Over 235,000 acres of crop land and over 12,881,000 acres of range land were infested. It is estimated that over 1,375,000 crop acres were

protected from Mormon crickets by control campaigns. Mormon crickets hatched in some areas as early as the latter part of February and in other areas as late as the second week in June. Included among the natural enemies of the Mormon cricket are: The egg parasite Sparaisson pilosum Ashm.; the wasp predator Palmodes laeviventris Cress.; an unidentified wasp; a scarabaeid larva, Aphodius denticulatus Hald.; sarcophagid flies; a round worm, Gordius sp.; spiders; reptiles; rats; mice; moles; badgers; coyotes; dogs; scorpions; and many species of birds. Range rehabilitation in many parts of the Northwest has been seriously handicapped by the crickets feeding on the flower heads and seeds of range plants. Grasses constitute over 20 percent of the recorded food plants, weeds about 65 percent, browse plants about 15 percent, and sedges and similar plants less than 5 percent. Both egg and adult surveys were conducted during the latter part of the summer and in the fall of 1938, to determine the intensity of infestation. The following table gives the infested acreage by States.

Mormon cricket infestation, fall of 1938

State	Acres infested (including agricultural lands)			
	Heavy	Moderate	Light	Total
	Number	Number	Number	Number
Colorado	0:	0:	0:	0
Idaho	53,500:	130,120:	650,560:	834,180
Montana	2,034,660:	2,670,245:	3,046,580:	7,751,485
Nebraska ^{1/}	0:	0:	8,480:	8,480
Nevada	337,020:	717,980:	1,223,328:	2,278,328
North Dakota ^{2/}	0:	35,800:	535,800:	571,600
Oregon	37,120:	472,800:	346,660:	856,580
South Dakota	6,900:	88,300:	1,943,800:	2,039,000
Utah	9,470:	13,030:	148,221:	170,721
Washington	1,920:	98,900:	183,580:	284,400
Wyoming	311,240:	490,430:	2,022,516:	2,824,186
Total	2,791,830:	4,717,605:	10,109,525:	17,618,960

^{1/}In addition, 152,480 acres are very lightly infested.

^{2/}In addition, 1,147,900 acres are very lightly infested.

ALFALFA WEEVIL

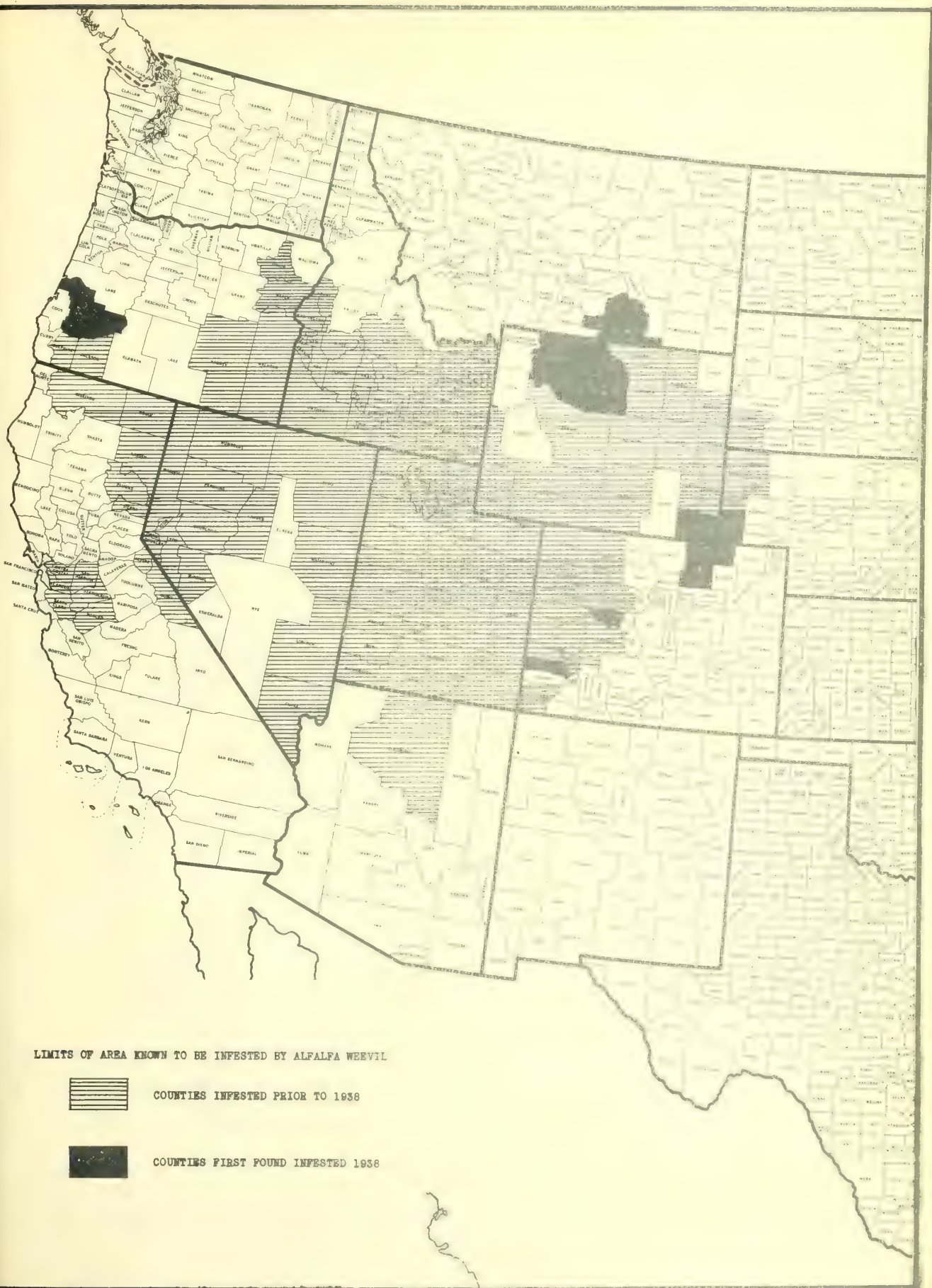
Alfalfa weevil populations, as determined by the 1937 fall survey, were generally more threatening than for several years. Damage was indicated in 40 to 50 percent of the alfalfa fields in Box Elder County, Utah, and Jackson County, Oreg.; in 17 to 33 percent of fields in Salt Lake and Sanpete Counties, Utah, the upper Snake River Valley of Idaho (Bingham, Bonneville, Jefferson, Madison, and Fremont Counties); Eagle Valley, in Baker County, Oreg.; Douglas and Washoe Counties, Nev., and Delta and Mesa Counties, Colo. Weevil damage threatened to affect 10 percent or less of fields in Sevier County, Utah; the lower Snake River Valley, in western Idaho and eastern Oregon; Churchill County, Nev.; Montrose County, Colo.; and Sioux County, Nebr. Actual developments in 1938 were as follows: Severe damage occurred in 50 percent of fields in Douglas County, Nev., and the upper Snake River Valley of eastern Idaho and in 35 percent of those in Sanpete County, Utah; moderate injury affected 15 percent of fields in Box Elder and Uintah Counties, Utah; slight damage occurred in 25 percent of fields in

Jackson County, Oreg., and in from 5 to 12 percent of the fields in Salt Lake, Duchesne, and Sevier Counties, Utah, Eagle Valley in Baker County, Oreg., Mesa, Delta, and Montrose Counties, Colo., Washoe and Churchill Counties, Nev., and Fremont County, Wyo.; negligible weevil damage occurred in the remainder of Utah, Oregon, Wyoming, southern and western Idaho, the infested lowland district of central California, and in the infested area of western Nebraska. Expected damage in western Colorado failed to materialize because of winter reduction of weevil populations, coupled with excellent growing weather in the spring and advanced harvest of the first crop; damage in Box Elder and Salt Lake Counties, Utah, and in Jackson County, Oreg., was kept below the expected level by general cutting of the first crop at early maturity; damage exceeding the estimates resulted from greatly belated cutting in the upper Snake River Valley of Idaho and in Douglas County, Nev.; in other districts the damage experienced was in close agreement with that indicated by the survey. Alfalfa seed-growing districts, where less frequent cutting tends to produce large weevil populations, also experienced damage during 1938. In Millard County, Utah, 30 percent of the fields were severely damaged and in southern Idaho (Jerome, Gooding, and Shoshone Counties) weevil damage seriously interfered with seed production from the first crop. Scouting by the alfalfa weevil laboratory staff, in cooperation with State organizations, resulted in original discovery of the alfalfa weevil in 12 additional counties, viz Pitkin, San Miguel, and Weld in Colorado; Banner and Kimball in Nebraska; Douglas in Oregon; Big Horn, Hot Springs, Laramie, Park, and Washakie in Wyoming; and Big Horn County in Montana. This is the first field infestation discovered in Montana. A detailed account of the survey has been issued as a Supplement to Insect Pest Survey Bulletin, No. 9, December 27, 1938. (J. C. Hamlin and W. C. McDuffie, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

VETCH BRUCHID

The vetch bruchid began emerging from hibernation quarters in North Carolina in April, the first adults being swept on April 18. They were present in all vetch fields by the first of May and, owing to the mild winter, the bruchid population was about the same as it has been in the last 4 years of observation, even though fewer adults were produced in the 1937 seed crop. Egg deposition began on May 4 and the last viable egg was found in the field on July 2. There were two definite peaks of oviposition this year, as a result of unseasonable weather in the latter part of May. The first peak was reached on May 19 and the next peak on June 6. Much heavier egg deposition was noted this year, as compared with last year. This can be accounted for by the favorable spring and the slower maturity of the vetch crop, which prolonged the period when pods were available for egg deposition. In 1937 on the row of Vicia villosa in the vetch varietal resistance experiment the daily egg count on 50 pods selected at random produced a total of 2,947 eggs during the period of egg deposition, while this year the same variety had a total egg count of 6,466. The weevil population in the 1938 crop of seed is just a little above the average of 50 percent usually prevalent in North Carolina, the average this year being 53 percent. The maximum infestation found in any field was 96 percent and the minimum 2 percent.

During the course of the year the known distribution in the East was increased by four counties in North Carolina, namely, Chatham, Surry, Wake, and Wilkes. In August the insect was discovered for the first time on the west coast in a number of vetch fields in the northern Willamette Valley of Oregon; in

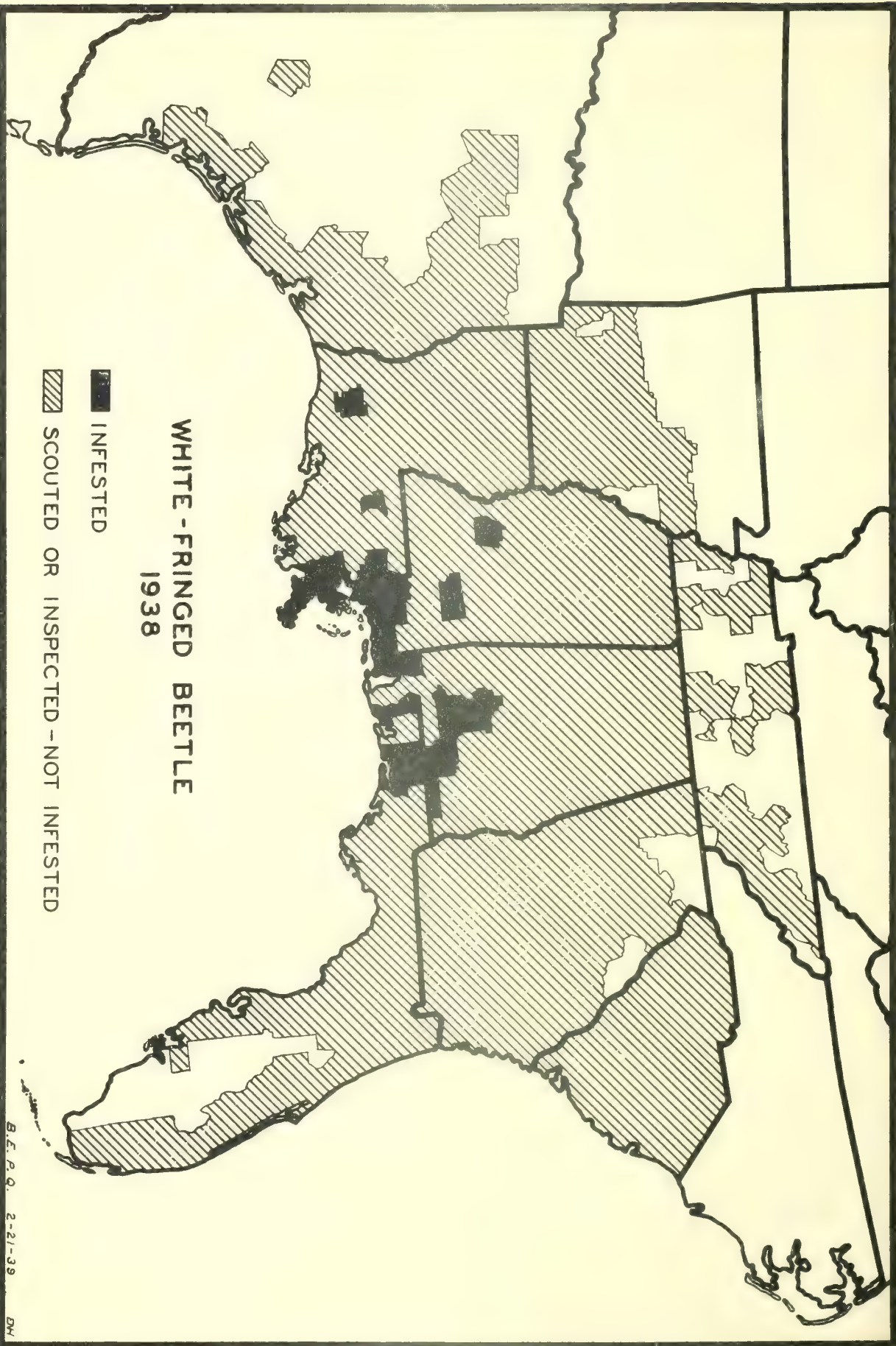




INFESTED

SCOUTED OR INSPECTED - NOT INFESTED

WHITE-FRINGED BEETLE 1938



Clackamas, Hood River, Marion, and Washington Counties, Wash. It was also found in seed cleaning mills where the weevil was found in seed being processed or on the premises in Multnomah County, Oreg., and Clark and Cowlitz Counties, Wash. As this infestation was discovered late in the season, after the vetch crop had been harvested, cleaned, and part of the seed shipped, it was too late for a thorough survey to be made to determine the extent of the area infested. The data on the western infestation was furnished by L. P. Rockwood, of the Forest Grove, Oreg., laboratory.

Collections of bruchid-infested seed were gathered in North Carolina and in Pennsylvania during the summer and placed in rearing boxes for the issuance of parasites. No parasites were reared from this material other than those reported in former years. Rockwood reports finding one specimen of Bruchobius mayri Masi from bruchid-infested seed at Reedsville, Washington county, Oreg. This gives a new distributional record for this parasite, which was first found in this country in 1936 and which has been reported only from Rowan and Iredell Counties, N. C., and from Adams County, Pa. A small release of Triaspis thoracicus Curt. was made at Statesville, N. C., and a large release at Arendtsville, Pa., in July. No adults of this parasite have issued from bruchid-infested material collected in both release areas. (J. S. Pinckney, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

WHITE-FRINGED BEETLE

The area known to be infested by the white-fringed beetle was greatly enlarged by intensive scouting during 1938. At present the beetle is known to exist in 23 counties in 4 States. The infested counties and States are as follows: Covington, Geneva, Monroe, Conecuh, Wilcox, and Mobile Counties, in Alabama; Escambia, Okaloosa, and Walton Counties, in Florida; Jackson, Harrison, Pearl River, Jones, Smith, Covington, and Hinds Counties, in Mississippi; Orleans, St. Bernard, Jefferson, St. Tammany, Plaquemines, East Baton Rouge, and Jefferson Davis Parishes, in Louisiana. The larger infested areas are around Florala, Ala., and New Orleans, La. In the Florala area a portion of 4 counties lying in 2 States are infested, while in the New Orleans area portions of 4 parishes are infested. The infested areas in the other counties are less extensive. The infestation at Glendale, Walton County, Fla., about 16 miles southeast of Florala, is the farthest east of any known infestation, the northernmost known infestation occurs at Bolton, in Hinds County, Miss., and the most western known infestation at Lake Arthur, in Jefferson Davis Parish, La. This insect is more abundant in the Florala, Ala., area than in any other area; however, the population was great enough elsewhere to cause some damage to garden crops at Laurel, Miss., and Monroeville, La. In the Florala area approximately 1,000 acres of heavily infested land was taken out of cultivation in 1938. The larval population on this retired acreage would have reduced the stand to such an extent that a crop would have been unprofitable. Much of the retired acreage was kept clean of vegetation during the active season of the adult beetle and, as a result, the larval population in the fall of 1938 was much less than it was the year before in these same fields. Notwithstanding the retirement from crops of 1,000 acres of the most heavily infested land, many fields were seriously damaged by larvae. These areas ranged in size from a few square yards to 10 acres. In many instances 3 plantings were made, but it was impossible to obtain a stand. The larvae in these areas kept the ground completely denuded of vegetation until shortly before pupation occurred. The larvae are known to attack practically all field and garden crops

and ornamental plants (over 125 species), and the adults are known to feed on more than 188 species of plants. Garden plantings of Irish potatoes were seriously damaged by the larvae during 1938. The adults emerged in the Florida area from the latter part of May to August 15; however, 87 percent of the total emergence occurred during the 30-day period, June 21-July 20. The adult emergence in heavily infested areas ranged from 50 to 110 per square yard. A survey made in November 1938 showed an average larval population in cultivated fields of 86 per square yard, as compared to 184 per square yard in 1937. Larval populations in excess of 200 per square yard were present in 1938 in a number of fields. The fall has been exceedingly dry and many eggs deposited in August and September had not hatched by December 15.

A new species of Naupactus, which was discovered in southern Mississippi in 1937, is now known to be generally distributed in the vicinity of Gulfport. This species is known to occur in only two Mississippi counties--Harrison and Stone. It caused serious damage to truck and garden crops during 1938 in the Gulfport area. The adults emerged from mid-May to early in October, and 50 or more emerged per square yard in the heavily infested area. Larval populations of 200 or more per square yard are quite common. (H. C. Young, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

CORN EAR WORM

The corn ear worm was in general only moderately abundant during the season and injury was unusually light in the northern part of the country from the New England States westward to the central Great Plains. Field examinations along the Atlantic seaboard indicate a high winter mortality, although survival in cages in New Jersey and Ohio was higher than in 1937, a year of great abundance of the insect. The insect also survived the winter of 1937-38 in cages in Kansas and Utah. Probably the rainy, cool weather prevented rapid reproduction. The warm dry weather in the fall favored development of the insect and heavy infestations were reported from scattered localities. In California the ear worm was abundant and destructive throughout the year.

ARMYWORM

During April serious outbreaks of armyworms were reported from the Gulf States. In Mississippi the damage to cotton was said to have been the worst in 25 years. Heavy damage to oats, alfalfa, and other crops was reported from Louisiana, Alabama, and Texas. These insects also appeared in destructive numbers very early in the season in Oklahoma and damage to wheat and oats necessitated poisoning. During May reports of damage were received from Tennessee and Kentucky eastward to the Eastern Shore of Maryland and Virginia. Moth flights were observed over much of this territory late in March. As the season advanced, damage was reported from the entire Mississippi Valley as far north as Michigan and Minnesota. Along the Atlantic seaboard flights were observed in New York State late in May and damage from the larvae was reported from Pennsylvania northward through New England during June, July, and August. Throughout this area the principal damage was to oats, with serious damage to newly planted grass. In New Hampshire the outbreak was said to be the most serious since 1919. In the Central and Middle Atlantic States a second flight of moths occurred about the middle of August, and throughout this area there was damage during the fall months. Report

of minor damage were received from Nevada, Utah, and California. Heavy parasitization was observed of much of the infested territory and in Illinois a wilt disease terminated the outbreak in June.

FALL ARMYWORM

During the last week in June fall armyworm was observed attacking corn in Mississippi. The damage increased as the summer advanced and serious damage was reported to corn and grass late in the summer and early in the fall. During the last week in October they were damaging gladiolus. In August and September damage to soybeans and corn in Louisiana and Texas was reported. Along the Atlantic seaboard scattered infestations in a variety of crops were reported during August and September from Georgia, North Carolina, Virginia, and Maryland. Local outbreaks were also reported from Arkansas, Missouri, and Kansas from August to late in October. Other States reporting injury were Indiana, New York, Connecticut, and Maine. In the last-named State there was heavy damage during the latter part of August and the entire month of September in the sections growing sweet corn.

CODLING MOTH

The Middle Atlantic and Middle Western States were characterized by a light apple crop and considerable infestation. A high surviving population in the spring was restrained by unfavorable early summer conditions and control was successful; favorable late-summer conditions allowed increase and injury, ending the season with average or higher infestation. In the Pacific States, especially Washington, high survival, early development and increase, with unusual late injury, were reported. New Jersey and eastern New York reported light early injury and moderate late injury; western New York a condition near normal; Maryland, Ohio, and South Carolina rather high infestation on a light crop. Virginia reported late season increase and injury, as did Kentucky and Michigan. Indiana reported high population and early activity, setbacks from weather in early summer, and increase to normal with favorable late summer conditions. Kansas reported similar conditions. Wisconsin reported unusual infestation, and Minnesota and Mississippi considerable infestation in unsprayed orchards. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

EASTERN TENT CATERPILLAR

This species was reported as present in considerable numbers in places, but not seriously injurious except locally. Decrease in lower New England, increase in places in the Middle Atlantic and South Atlantic States, and some abundance in upper New England, were noted. Maine, Vermont, and New Hampshire reported abundance in southern localities, while Massachusetts and Connecticut reported a decrease. Delaware, North Carolina, South Carolina, and Ohio, reported increase, and abundance was noted from eastern Maryland and southeastern Virginia. The species was reported as common but not abundant in Arkansas, Florida, New Jersey, and central Maryland and as abundant in places in Mississippi and New York. Hatching periods ranged from February in Florida to March in the Cotton Belt States, April 1 in the District of Columbia, and late in April in Maine and Vermont. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

The eastern tent caterpillar caused many complaints from residents of Broome and Delaware Counties, N. Y. The wild cherry and apple trees along the rural highways and fence rows, and in pastures were heavily infested. In some parts of New England it was abundant locally. (J. V. Schaffner, Jr., Bureau of Entomology and Plant Quarantine, U. S. D. A.)

ORIENTAL FRUIT MOTH

During 1938, weather conditions appear to have been particularly favorable for the development of the oriental fruit moth in most districts from western Virginia to Connecticut. It is, therefore, not surprising that there has been a marked increase in moth damage to fruit in some sections. This project has observed heavy infestation of midseason peaches in the vicinity of Harrisonburg, and in the Timberville district. Heavy infestation of Elberta peaches and varieties ripening at about the same time has been reported from isolated orchards in northern New Jersey and from Connecticut. There has been a rather distinct correlation between light fruit infestations and heavy parasitization in the districts under observation. Data on observations on fruit infestation in several districts follow. These observations are based on careful sampling, and cutting all fruit samples, and were all made on Elberta or varieties ripening at about the same time.

District	:	:	:	Fruits injured by		
	:	:	:	oriental fruit moth		
	:Orchards:	Fruit	:	:	:Calculated	
	:surveyed:	examined:	Total	Fruits	fruit	
:	:	:	:	per tree:	per acre	
	: <u>Number</u>	: <u>Number</u>	: <u>Percent</u> :	<u>Number</u>	<u>Number</u>	
<u>Maryland:</u>	:	:	:	:	:	
Hancock	: 3	: 1,100	: 6.5	: 17.7	: 1,982	
Smithburg-Ringgold	: 3	: 1,000	: 3.2	: 7.8	: 772	
<u>New Jersey:</u>	:	:	:	:	:	
Mercer County	: 2	: 800	: 20.3	: 113.7	: 11,439	
Moorestown	: 8	: 3,200	: 15.5	: 51.8	: 3,993	
<u>Virginia:</u>	:	:	:	:	:	
Clearbrook	: 3	: 1,100	: 16.1	: 34.0	: 2,987	
Crozet	: 3	: 1,200	: 2.4	: 13.2	: 1,265	
Harrisonburg	: 2	: 600	: 36.9	: 177.0	: 13,924	
Staunton	: 2	: 700	: 30.7	: 39.8	: 2,425	
Timberville	: 3	: 1,100	: 27.1	: 105.1	: 10,763	
<u>West Virginia:</u>	:	:	:	:	:	
Martinsburg	: 3	: 1,100	: 16.2	: 90.6	: 6,314	
	:	:	:	:	:	
Total	: 32	: 11,900	: ---	: ---	: ---	

(H. W. Allen, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

Although oriental fruit moth injury to twigs was observed early in the season in Louisiana no fruit injury was observed later in the season. In Mississippi, however, there was moderate damage in several parts of the State in August. In Tennessee heavy twig infestation was reported from scattered localities in May. Late in that month and early in June the insect appeared to be much more abundant than last year in Kentucky; however, the Elberta peaches were harvested before fruit moth attack. The moths appeared in larger numbers than for several years during the latter part of May in Illinois and Ohio and severe twig injury resulted; however, there was less than the usual extent of fruit injury. In Michigan pupation was well under way during the last week in March and the first 2 weeks in April and the insect proved to be injurious. Along the Atlantic seaboard first pupation was observed about the middle of March in Georgia and late varieties of peaches suffered heavy injury. The commercial crop was not damaged in central Georgia; however, in the northern part of the State there was a 9-percent infestation early in July. In Virginia there was a 20-percent loss of fruit in Frederick and Shenandoah Counties, the heaviest infestation for several years. In West Virginia and Maryland the infestation was generally light, as was also the case in Delaware. In the last-named State parasitization was the heaviest observed in 10 years. Moderately heavy infestations of fruit were reported from New Jersey and there was also considerable injury reported from the eastern part of New York State. In Connecticut the infestation was about twice as heavy as in 1937.

PLUM CURCULIO

This insect did not in general cause severe injury in 1938, but showed some signs of increase in the North and East. An early start, with some setbacks later, was reported from Georgia, Virginia, and Delaware. A second generation injured peaches in central Georgia but was light in northern Georgia. Some second-generation development was reported from Kentucky and southern Virginia, and early development indicated possibility of a second generation in Missouri and Delaware. Increase or considerable injury to apples was noted in Maine, Vermont, Michigan, and Wisconsin; to peaches in New Jersey, Pennsylvania, north-eastern West Virginia, and Ohio; and to several fruits in New York. Massachusetts and Tennessee reported the species about normal, Mississippi and Arkansas reported some injury to peaches, and Florida noted less injury than normal. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

PEACH BORER

The peach borer was reported in its usual abundance over most of the Eastern States. Reports of unusual abundance were received from Connecticut and Virginia. Favorable weather late in the season resulted in an infestation heavier than usual in the Fort Valley section of Georgia.

VEGETABLE WEEVIL

The vegetable weevil has done more damage to truck crops during the past year than ever before. Entire plantings of turnips, carrots, mustard, and cabbage have been destroyed along the Gulf coast from Texas to Georgia. Serious damage was also done to onions, Irish potatoes, and practically all vegetables, with the exception of peas. The insect has spread all over the southern half of Alabama and three-fourths of the way up on the western side of the State. It was

abundant enough in tobacco plant beds in parts of Florida to require control measures. Similar damage to tobacco plant beds and also to early set tomato plants was reported from Georgia. This year the vegetable weevil was reported from Cherokee County, Tex. This is an area where tomatoes are grown extensively and where heretofore this pest was not recorded. In southern California the weevil was reported as damaging cover crops in citrus orchards early in March. Celery was heavily infested late in that month but only scattered reports of serious damage to other garden vegetables were received. Early in May the weevil severely attacked newly set tomato plants.

PEA APHID

The pea aphid caused a great deal of injury to alfalfa in the Middle Atlantic States, Utah, southwestern Idaho, and on the Pacific coast. Some injury was caused to canning peas in the Middle Atlantic States, Wisconsin, and Utah. Early in the season the warm dry weather in the Middle Atlantic States favored rapid reproduction and more damage to alfalfa than usual occurred in Delaware and New Jersey. The insects migrated early to peas and, although the early varieties on the Western Shore of Virginia escaped injury, early peas on the Eastern Shore of that State and in Maryland were damaged. In New York, on Long Island and in central New York the aphid was found on peas during the first half of May, but cool, damp weather following checked development and only light damage occurred. Some damage to peas in the North-Central States was reported. On the West coast, although very early in the season, the weather was favorable and the insect became conspicuous, unfavorable weather in March held it in check and it was April before it got off to a good start. It caused serious injury before the middle of May. In central and southern California the second cutting of alfalfa was damaged instead of the first cutting as usual. Late in fall favorable weather in the Eastern, North Central States, South Dakota, and Utah permitted a heavy increase in populations mostly in alfalfa.

MEXICAN BEAN BEETLE

The Mexican bean beetle passed the winter successfully and began emerging earlier in the spring than usual over most of its range. However, the rather cool, rainy weather in the northern part of its range retarded reproduction and early beans generally were not so seriously injured as in some years. By the first of July injury was being reported generally, and continued to be severe until the end of the season. The insect extended its distribution west of the Mississippi River, having been reported for the first time from Louisiana and Arkansas, where it was injuring beans in the field. It was also discovered in the field in southeastern Missouri, which is the first record of injury in the State. The insect was previously taken at Saint Louis in a Japanese beetle trap in 1936. In central Maine and in New York around Lake Erie where the insect occurs locally it was found during the season to have spread and also to be causing real injury for the first time. It was reported from Hinds County, Miss., which is the first record for that county and which extends the distribution southwestward in that State. The insect is becoming more abundant and injurious in southern Georgia, and it was found for the first time in Gadsden County, Fla., the second infestation in that State. It was reported from Jefferson County, Fla., in 1933. Some injury was reported from east-central Utah and severe injury from Arizona and Colorado.

TOMATO PINWORM

The tomato pinworm survived the winter of 1937-38 in California in large numbers because of mild weather and continuous growth of tomato vines, but heavy losses to tomatoes did not occur during the season, except in areas of almost continuous tomato growing. A survey of representative tomato fields in southern California showed the following degree of fruit injury: Orange County, 11 percent; San Diego County, 30 percent; San Bernardino County, 3 percent; Los Angeles County, 23 percent; and Ventura County (Santa Rose Valley only), 10 percent. Thirteen tomato fields in the upland, or almost continuous tomato-growing areas of these counties, ranged from 5 percent to 70 percent injury, with an average of 32 percent, while 10 fields from the lowland, or summer-growing areas, ranged from none to 17 percent injury, with an average of 8 percent. Some increase in injury occurred late in the season but the ratio remained about the same. The pinworm has recently been found in the Niland area of Imperial Valley, where midwinter tomatoes are grown. (J. C. Elmore, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

Note.---According to C. A. Thomas, careful examinations of greenhouses and gardens in Pennsylvania in the Chester County and New Castle, Lawrence County, areas during the spring and summer of 1938, failed to disclose a single specimen of the tomato pinworm.

BEEF LEAFHOPPER

In southern Idaho precipitation above normal during April and May 1937 caused a dense stand of Russian-thistle, the summer host plant of the beet leafhopper, to germinate. Abnormally dry summer weather reduced the suitability of dense stands for leafhopper development and early fall populations were the lowest in the last 4 years. Above-normal fall temperature, with sufficient precipitation, permitted adequate fall germination of mustards, the leafhopper's natural fall and winter host plants. Consequently, the beet leafhopper left its holdover host with little delay and entered the winter under favorable conditions. The winter was extremely mild and in general was very favorable for survival. Surveys of the desert areas in April 1938 showed a larger overwintered population of leafhoppers than in any of the 3 preceding years. One of the most unexpected situations occurred during the warm days of April and the early part of May, when a movement of overwintered leafhoppers migrated into the cultivated area. An average of 24.4 leafhoppers per 100 feet of row of beets was recorded for south-central Idaho, and undoubtedly this large movement affected the magnitude of the spring generation in the desert. The initial movement of the spring generation occurred on May 26, which is the average date for the last 13 years, and the peak was reached on June 17. The premature drying of annual spring-breeding wild host plants, in the Sailor Creek sagebrush section, lying south of the Snake River and west of the Salmon Falls Creek, together with the area west and northwest of the Jerome cultivated tract, was very important in reducing the abundance of the spring generation of leafhoppers. The number of leafhoppers in the spring movement in 1938 was approximately two-thirds as large as in 1935, four times as large as in 1936, and one-third as large as in 1937. In a small number of fields, where beets followed beets and where a few 1937 volunteer beets were still growing, the overwintered beet leafhopper that entered the fields early in the season transmitted the curly top disease from the volunteer to the seedling beets during their most susceptible stage, which resulted in reduction of yields, ranging from 25 to

40 percent. Other fields were infested early in the season with a comparatively high population of overwintered leafhoppers, resulting in a high percentage of plants in such fields being infected by the curly-top disease. Surveys of commercial bean fields in July showed that curly-top injury to beans was very light, ranging from 0 to 13.5 percent in garden varieties and from 0 to 5.5 percent in the Great Northern, a dry-bean variety. Fall populations of the beet leafhopper in southern Idaho in 1938 were the lowest recorded in the last 5 years. Fall germination of the fall and winter weed host of the beet leafhopper was widespread by the end of October. Weather conditions up to the end of January 1939 have been favorable for survival. Overwintered beet leafhoppers were found in the Billings, Mont., area early in May, confirming the findings in 1936 and clearly showing that this insect can survive certain types of winters in Montana. In this area the most severe outbreak of curly-top since 1935 occurred.

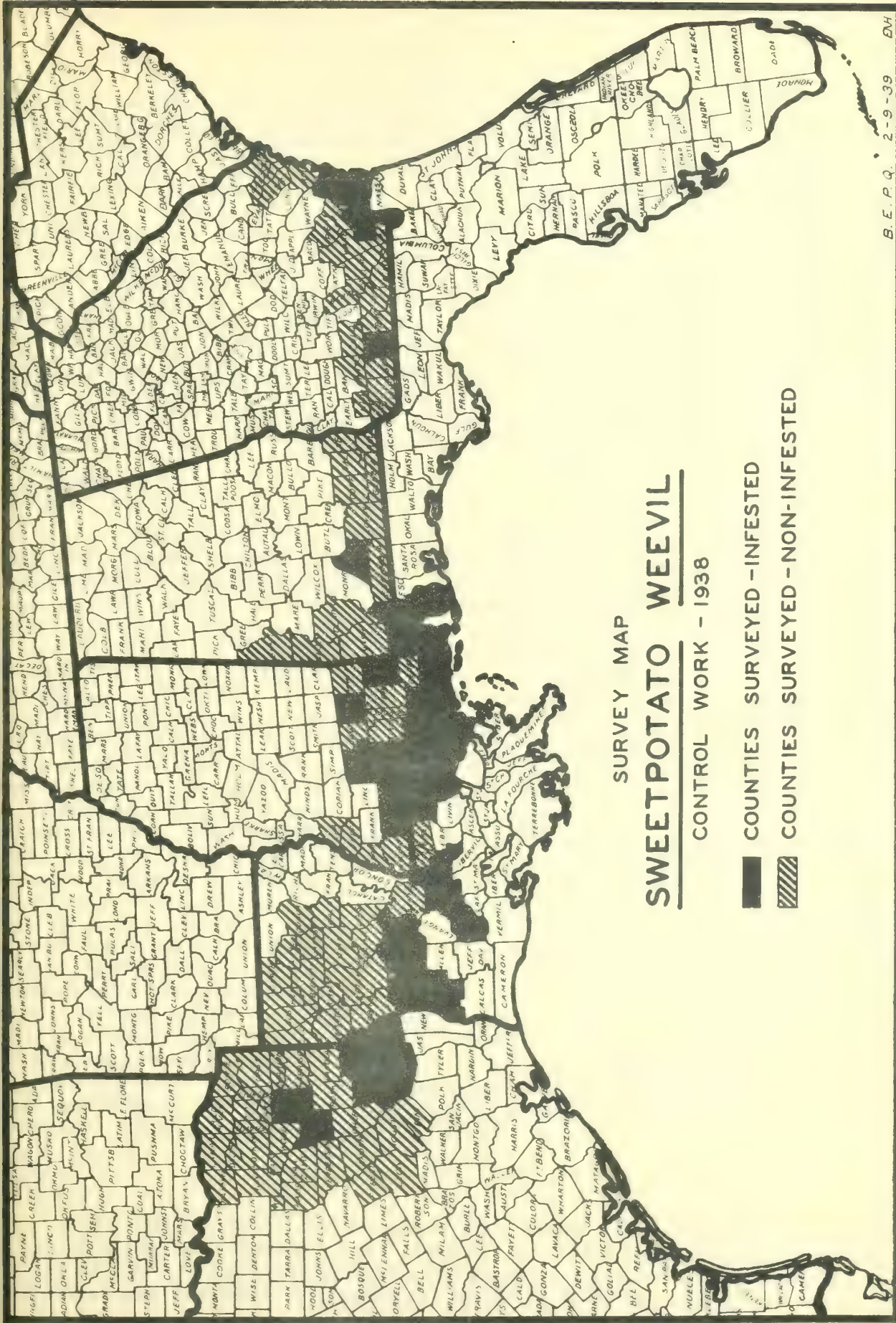
A survey of the Yakima Valley, Washington, beet-producing area was made during the first half of June. The beet leafhopper populations varied from an average of 28.5 adults per beet at Prosser to 1.16 at Haybom. Evidently an early movement of overwintered beet leafhoppers moved into the cultivated area, which accounts for the large nymphs present in the fields. The mild winter was favorable for survival of the small plants not harvested, and these "volunteer" plants were reservoirs of the virus and account for the severe cases of curly top in a few fields. (J. R. Douglass, Bureau of Entomology and Plant Quarantine, U. S. D.)

SWEETPOTATO WEEVIL

Surveys for sweetpotato weevil infestations were carried on in 1938 in Alabama, Georgia, Mississippi, and Texas, cooperatively with the pest-control officials of these States. Areas in which the production of sweetpotatoes is undertaken on a commercial scale and in which the infestations are more or less isolated, represent the field in which cooperative activities are conducted. To attempt eradication in the heavily infested areas along the Gulf coast would prove futile under present conditions, it is believed, owing to the prolific growth of wild host plants on the coast and nearby islands. Survey work is of two types: Spotted survey, where no infestation of the weevil is definitely known to exist; and intensive or house-to-house inspection in localities where weevils are found, covering a radius of 5 miles of each infested property. A summary of such work in the calendar year 1938 is as follows: Alabama--counties surveyed, 12, counties found infested, Baldwin, Mobile; Georgia--counties surveyed, 72, counties found infested, Camden, Glynn, Thomas; Mississippi--counties surveyed, 20, counties found infested, Amite, Green, Harrison, Jackson, Jeff Davis, Jones, Lawrence, Marion, Pearl River, Pike, Stone, Walthall; Texas--counties surveyed, 13, counties found infested, Angelina, Cherokee, Gregg, Nacogdoches, Sabine, San Augustine, Shelby. The accompanying map shows these counties. (R. A. Sheals, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

TOBACCO MOTH

In August and September, 1938, the first serious outbreak of the tobacco moth occurred on tobacco farms in North Carolina and Virginia. The first infestations in bulk of cured tobacco in growers' pack houses were observed the latter part of August and a survey conducted in September showed that heavy infestations were present over a wide area in Rockingham, Forsyth, and Durham Counties, N. C., and in Pittsylvania County, Va. Light infestations were found





also in Guilford, Caswell, Person, Granville, Wake, Chatham, Orange, Johnston, Wilson, Pitt, and Lenoir Counties, N. C. Prior to 1938 the pest was practically unknown on the farms in this country. The losses by tobacco growers were principally as follows: (1) Leaves badly damaged by larvae in the bunks and discarded during stripping and grading; (2) a greater quantity of scrap tobacco resulting from grading; and (3) loss in weight and quality of the infested tobacco sold. The degree of damage on individual farms ranged from slight injury to leaves of the first and second curings to losses as high as $33\frac{1}{3}$ percent of the crop. The season of 1938 was generally favorable for the development of the insect. The populations of moths were larger in storage warehouses of cured tobacco than in 1937. Due to unusual climatic conditions the flue-cured tobacco crop matured about 30 days earlier than normal, which brought about a corresponding early curing season. The abundant moth populations and the long storage period in the growers' pack houses brought about by the early curing season are believed to be important factors causing the serious outbreak on the farms. (W. D. Reed, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BOLL WEEVIL

The loss caused by the boll weevil, which began a downward trend in 1933, continued downward until 1936, increased slightly in 1937, and increased still more in 1938. A higher-than-average number of weevils entered hibernation in the fall of 1937, but the percentage of survival in 1938 was much lower than the unusually high survival the previous year. In the hibernation cages at Florence, S. C., and Tallulah, La., the survival in 1938 was about one-tenth, and at College Station, Tex., it was one-fourth as great as in 1937. Despite the lower percentage of survival, the larger number of weevils entering hibernation caused the weevils to be more numerous in the fields early in the spring in most parts of the Cotton Belt than for the past several years. In the States along the Atlantic seaboard the 1938 weevil damage was greater than it has been for a number of years and was particularly heavy in the sea-island cotton in Georgia and Florida. In the middle and Delta sections of the Cotton Belt the damage was considerably greater than in 1936 or 1937, but was still below average. Weather conditions in these areas were favorable for development during the early season but a hot, dry spell early in July temporarily checked the weevils and permitted early cotton to mature with but slight damage. Late cotton, however, was severely damaged. At Tallulah, where the increase in yields obtained by dusting over a period of years is used as an index of weevil damage, the average gain was 9.6 percent, or about half as great as the 10-year average of 19.3 percent. In eastern and southern Texas, where the damage has been much higher than average for the last 2 years, the damage in 1938 dropped to below normal in southern Texas and to about normal in eastern Texas. Early frosts and defoliation by leaf worms (Alabama argillacea (Hbn.)) reduced the number of weevils that entered hibernation this fall to about the usual numbers, except in the States along the Atlantic seaboard, where probably more than average numbers went into hibernation. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BOLLWORM

Damage caused by the bollworm was more severe and occurred more generally in 1938 than for a number of years. Reports of injury were received from practically all of the Cotton States from the Atlantic seaboard to the irrigated sections of the Southwest. Damage was especially heavy in the river bottoms of

Texas. In many sections the damage was caused by a comparatively light infestation that extended over most of the period of crop development, instead of the usual distinct peaks of infestation. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

COTTON LEAF WORM

The first appearance of the cotton leaf worm in the United States in 1938 was reported from Calhoun County, Tex., on May 2, the earliest record since 1922. Spread was fairly rapid and occurrences in other areas were reported as follows: Hidalgo County, Tex., June 10; College Station, Tex., June 18; Presidio, Tex., July 7; Tallulah, La., July 16; Garvin County, Okla., July 16; Columbia, Ark., July 16; Holmes County, Miss., July 16; Tucson, Ariz., July 28; McIntosh County, Ga., July 29; Madison, Fayette, Dyer, Gibson, Lauderdale, and Shelby Counties, Tenn., August 19; and Florence, S. C., August 27. During the latter part of September migration was general and moths were reported from Ohio, Pennsylvania, Indiana, New York, Massachusetts, Vermont, and New Hampshire. Notwithstanding the early appearance and widespread distribution, the population did not increase as rapidly as expected and little damage was caused to early cotton. Considerable poisoning was necessary to protect late cotton west of the Mississippi River but little poisoning was needed east of the river. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

COTTON FLEA HOPPER

Hibernation studies at Port Lavaca, Tex., showed a normal emergence of flea hoppers from overwintering eggs during the spring months. The emergence from 3,800 plants during 1937 was 44,951, as compared to 44,927 nymphs in 1938. The peak of the emergence this year was on April 23, or 29 days later than in 1937. From April 26 to May 3, 80.8 percent of the year's emergence took place. The infestation on cotton in southern Texas was much higher in 1938 than in 1937, but not higher than the average for the previous 4 years. The damage was severe in many localities where control measures were not applied. In Texas control measures for the flea hopper were used rather widely and to good advantage. Dusting at Port Lavaca showed an average gain of 312 pounds of seed cotton and a net profit of \$9.65 per acre. The only other section from which reports of heavy damage were received was north-central Georgia. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

PERIODICAL CICADA

A few old, doubtful records were used to make up Brood XII of the periodical cicada, which is scheduled to appear in 1938. C. L. Marlatt, (U. S. Dept. Agr., Bur. Ent. Bull. 71, 1907) refers to the brood as very doubtful. In 1904 no data were received to confirm the old records; however, the brood was extended by records of the appearance of the cicada in Mount Olivet Cemetery in Baltimore, Md., and at Catoctin Mountain near Braddock, Md. In 1921, the next year for the appearance of the brood and also the year of the inauguration of the Insect Pest Survey, J. A. Hyslop made an effort to procure reports from all localities from which records were ever made. He received negative reports from all localities. In 1938, Mr. Hyslop again asked the collaborators of the Insect Pest Survey to look for the insect. All reports were negative, except from West Virginia, where F. W. Craig reported the occurrence of the insect in Cabell County, the county

from which it was reported originally in 1887. Mr. Craig also observed it in three adjoining counties--Mason, Putnam, and Lincoln. J. J. Davis reported that the insect was heard at Orleans, Orange County, Ind., on May 26, 1938. This is a new record for this brood. P. Knight made a thorough search in Maryland in the two places where the records were made in 1904, but saw no signs of the insect.

SMALLER EUROPEAN ELM BARK BEETLE

Distribution records obtained in 1938 have somewhat enlarged the known range of Scolytus multistriatus Marsh. These additional records show the species to be well distributed on both sides of the Ohio River where this river forms the boundary between northern Kentucky and the adjoining portions of Indiana and Ohio. Other findings for the first time disclosed the presence of the beetle in the Brunswick, Md., and Cumberland, Md.--Wiley Ford, W. Va., areas. These areas are considered as outlying areas of Dutch elm disease infection. The finding of this beetle at Hagerstown and in other localities in Washington County, Md., and at Scottdale, Westmoreland County, Pa., tends to connect areas previously known to be infested. (C. W. Collins, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

EASTERN SPRUCE BEETLE

The epidemic of the eastern spruce beetle in the Green Mountains of Vermont is subsiding. A survey late in the summer of 1938 showed that the number of infested spruce was considerably less than in 1936 and 1937. In the Waterville Valley section of the White Mountain National Forest, in New Hampshire, a very light endemic infestation was found in overmature spruce stands. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

SOUTHERN PINE BEETLE

The severe outbreak of the southern pine beetle in loblolly pine in southeastern Virginia and northeastern North Carolina was found to have subsided in the fall of 1938, in all areas examined. Smaller outbreaks were recorded near Wilmington, N. C., and in the Great Smoky Mountains National Park, Tenn., in pitch and shortleaf pine during the summer of 1938. (B. H. Wilford, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BLACK HILLS BEETLE

In the central Rocky Mountain region Dendroctonus ponderosae Hopk. has continued in epidemic form. In Colorado, in an area extending along the eastern range of the Rockies from the central to the northern part of the State, fall surveys indicated that 24,000 ponderosa pines were infested during the current flight of this beetle. This reduction of 20,000 trees from last year is due largely to control work. No radical changes have been noted in the Wyoming infestations (210,000 trees in 1937) in limber pine and lodgepole pine, except on the Medicine Bow National Forest where control work reduced the infestation from 12,000 trees last year to 1,200 this year. In parts of southern Utah the infestation has maintained epidemic proportions, notwithstanding control work. (J. A. Beal, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

ROUNDHEADED PINE BEETLE

In northern New Mexico Dendroctonus convexifrons Hopk. increased greatly during the recent drought years and killed large numbers of pole-size and mature ponderosa pine trees. On the Santa Fe National Forest alone over 50,000 trees were treated in 1937. The large amount of control work, together with improved growing conditions for the trees in 1938 appeared to check the epidemic. (J. A. Beal, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

MOUNTAIN PINE BEETLE

In northern Idaho and western Montana this insect became more generally destructive in stands of western white pine in 1938, especially on the Clearwater and Kootenai National Forests. Losses are still occurring in a few areas of lodgepole pine in the northern Rocky Mountains, and in white bark pine stands in and adjacent to Yellowstone National Park, although the widespread epidemic of a few years ago in lodgepole has generally subsided. In Mount Rainier National Park, in Washington, the beetle was found in epidemic numbers, and killed many large groups of western white pine. In California one area on the Tahoe National Forest, in the central part of the State, showed a marked increase of the beetle in sugar pine, and there was also an increase in the lodgepole pine infestations in Yosemite National Park. One infestation, however, reported in 1937 near Camp Nelson, in Sequoia National Park, died down in 1938. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

WESTERN PINE BEETLE

In Oregon and Washington Dendroctonus brevicornis Lec. was more aggressive in 1938 than in the previous 2 years. Intensive surveys covering 88,560 acres of sample plots indicated that losses would exceed 500,000,000 board feet of commercial pine timber. In California this season, infestations were on the increase for the first time since 1934. While this increase is general throughout the ponderosa pine type, it is more pronounced in the eastside type of northeastern California. This build-up is rather striking because it has followed two seasons of heavy precipitation, which have resulted in improved conditions for tree growth. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

DOUGLAS FIR BEETLE

Destruction of Douglas fir continued to be severe in many areas throughout the entire Rocky Mountain region. In parts of central Colorado, southern Utah, and northern New Mexico it is believed that from 50 to 70 percent of the Douglas fir stands have been wiped out, although no accurate surveys of losses have been made. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

ELM LEAF BEETLE

Infestations were heavy in many localities through New England and New York in 1938, causing severe injury to the elm trees, particularly in the residential districts. Specific areas where outbreaks are known to have occurred in 1938 include the townships of Augusta and China, in Kennebec County, Maine,

and south through Merrimac and Rockingham Counties, N. H., Essex, Middlesex, and Norfolk Counties, Mass., New Haven County, Conn., Rutland County, Vt., and some localities in Columbia, Monroe, and Sullivan Counties, N. Y. (J. V. Schaffner, Jr., Bureau of Entomology and Plant Quarantine, U. S. D. A.)

A LEAF BEETLE

A leaf beetle, Chrysomela tremulae F., was reported to be causing heavy defoliation of aspen over extensive areas in the Allegheny National Forest, in northwestern Pennsylvania. In northern Minnesota, on parts of the Superior National Forest, small groups of aspen in one district were completely defoliated. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BAGWORM

Numerous inquiries during the summer of 1938 indicated that the bagworm was more prevalent than usual on ornamental evergreens from New York City to Ohio and western Kentucky and south to Georgia and South Carolina. Several inquiries also came from Texas. In the Carolinas and Tennessee heavy defoliation and some permanent injury to ornamentals was recorded. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

GYPSY MOTH

The hatch of egg clusters of the gypsy moth in the spring of 1938 was not as pronounced as in 1937. Egg clusters collected over a more or less extended area showed some of the clusters as total nonhatch. The average hatch, however, was about 63 percent. The spring mortality of the young larvae was high in 1938. The defoliation during the summer of 1938 was much less extensive than was recorded for the same territory in 1937, being but slightly more than half of that recorded for the previous summer. In Maine, the total area of defoliation was somewhat less than in 1937, although in three of the counties there was a substantial increase in the areas affected, over that recorded in 1937. In New Hampshire the areas of defoliation were much less extensive, the total acreage being about half of that recorded in 1937. In Massachusetts, as in New Hampshire, the total area of defoliation was only about 50 percent of that recorded for the year 1937. In Barnstable County, however, there was a considerable increase, and a moderate increase in Essex County. In Franklin, Hampshire, and Hampden Counties the total defoliation in the towns east of the Connecticut River was somewhat less than that recorded in 1937; however, in towns west of the river the area of defoliation increased considerably. In Rhode Island there was an increase in the area of defoliation over that recorded in 1937, while in Vermont and Connecticut the area of defoliation increased markedly over that recorded in 1937. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BROWN-TAIL MOTH

During the summer of 1938 there were not many reports of defoliation by this insect, although in Maine there were a number of towns where a considerable defoliation was noted, and in one town in Cumberland County an area of almost solid oak growth was completely defoliated. In New Hampshire and Massachusetts very

little defoliation was noted; in Barnstable and Plymouth Counties, Mass., the infestation was heavy in some localities. The wholesale cutting of webs over the entire infested area in 1935-36 and in 1936-37 reduced the infestation considerably. Since this work was abandoned the infestation has increased rapidly in some localities. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

SATIN MOTH

In general, the infestation throughout the infested area remains light, and most of the defoliation noted was confined to a few poplar trees. In Maine noticeable feeding was noted in only 2 towns. In 1 town in Cumberland County about 150 poplar trees were completely defoliated. In New Hampshire noticeable feeding was noted in 6 towns, in 1 town in Carroll County about 1-1/2 acres of poplar growth were completely defoliated. In Vermont only a few trees, which were partially defoliated, were noted. In Massachusetts some defoliation was noted in 21 towns. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

Local outbreaks of the satin moth occurred in the vicinity of Plymouth and Lebanon, N. H., and in Hartford, Vt., in 1938. (J. V. Schaffner, Jr., Bureau of Entomology and Plant Quarantine, U. S. D. A.)

FOREST TENT CATERPILLAR

Observations in Vermont indicated that, in general, the infestations in Addison and Bennington Counties during the past summer were much less severe than in 1937, while in some parts of Windsor and Orange Counties severe defoliation was more apparent in 1938. Many sugar-maple orchards show the effects of severe defoliation in the last 1 to 4 years. In western Massachusetts and north western Connecticut some rather heavy, local infestations were noted. It was also serious in parts of New York, particularly in Sullivan, Greene, Delaware, and Broome Counties. In southeastern South Carolina the defoliation of hardwood, especially tupelo gum, was extremely severe, and this was of primary importance to beekeepers of the vicinity who depend on certain of these trees as a source of honey. In northeastern Michigan heavy defoliation was reported on an area covering several thousand acres. In northern Minnesota, however, where a very widespread epidemic has been in progress for several years, there was a tremendous mortality to the insect in 1938, owing to adverse weather conditions early in the season and to heavy parasitization. Egg counts in September indicated a low degree of infestation in this region. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

SPRUCE BUDWORM

In northern Minnesota the form that attacks jack pine increased in abundance and caused rather severe and widespread defoliation, although good growing conditions apparently prevented any tree mortality. In Colorado the form infesting ponderosa pine continued in an increasing epidemic status in the central part of the State and was found to occur also in other parts of the Central Rock Mountain region. In this same region the form attacking Douglas fir and white fir showed an increase in 1938, but was not abundant enough to cause the death of infested trees. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

HEMLOCK LOOPER

The severe and widespread outbreak of Ellopiia fiscellaria lugubrosa Hulst. that appeared in the fir stands of northern Idaho and western Montana in 1937 continued during 1938, although in some of the most heavily defoliated areas there was a decrease in the amount of feeding this season. Many tree species besides the preferred true firs were attacked, and in some areas the upper limits of white pine stands were severely injured. Near Darrington, Wash., adults were noted in flight in unusual numbers, but no defoliation was observed. The last outbreak in this locality in Washington occurred about 10 years ago. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

DOUGLAS FIR TUSSOCK MOTH

The outbreak that has been present in the Sawtooth National Forest, Idaho, for the last 2 years continued at approximately the same severity in 1938. Working in association with this insect is a looper identified as Nepytia canosaria Walk. var., and these two insects have caused a complete destruction of all Douglas fir in the defoliated area. In the Blue Mountains of Oregon the tussock moth extensively defoliated white fir and Douglas fir, and as a result some of the timber will die. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

LARCH SAWFLY

In the northern part of the Lake States the larch sawfly appears to be on the increase, although it is not abundant. In northern Montana the outbreak occurring on the north fork of the Flathead River during the last several years continued at about the same severity as in 1937, without doing serious damage. A new infested area was reported on the middle fork of the Flathead River, in Glacier National Park, but the sawfly is not in epidemic form in this area. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

TWO LARCH SAWFLIES

The two larch sawflies, Platycampus laricis Roh. and Midd., and P. larivorus Roh. and Midd., were reported in northern Idaho some 20 miles north of Coeur d'Alene. This is the first outbreak of these two species that has been recorded since their first known appearance in 1921. (J. C. Evenden, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

EUROPEAN SPRUCE SAWFLY

Surveys of spruce areas, in cooperation with the States of New Hampshire, New York, and Vermont, in 1938 showed that this insect was present in at least small numbers wherever spruce was examined. In New Hampshire very heavy infestations occur on Mt. Monadnock, and on Pack Monadnock and Temple Mountains near the Peterboro-Temple town line, also a medium-to-heavy infestation occurs near Mt. Kent, in the town of Pittsburgh, in the northern part of the State. In Vermont the infestation is very heavy in the towns of Wilmington and Marlboro, in the southern part of the State, medium to heavy on Green Peak, in Dorset Township,

located in the southwestern part of the State, and on Mt. Ellen, Mt. Abraham, and Mt. Battell, in the central part of the State. In Lincoln, Vt., where the infestation was heavy in 1937, it now seems to be somewhat reduced. In New York a number of medium-to-heavy infestations were found in plantations of Norway spruce in Columbia, Dutchess, Ulster, Otsego, and Chenango Counties. Although no defoliation was noticeable in the Adirondacks, this insect was quite numerous there in some of the older stands of spruce. In Maine, reports from State Entomologist Peirson indicate that there has been an increase in the intensity of the infestation in the northern part of the State and in about 4 townships in Washington County. Between 5 and 6 million parasites, Microplectron fuscipennis Zett., reared in the forest-insect laboratory of this Bureau at New Haven, Conn., during the spring and early part of the summer were colonized in spruce sawfly infestations in Maine, New Hampshire, Vermont, and New York. Larger numbers of this parasite were reared and liberated in portions of Maine by officials of that State (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

AN INTRODUCED SAWFLY ON PINE

Acantholyda erythrocephala L. is an introduced sawfly that feeds on the foliage of pine. It is widely distributed in Europe and is recorded from Chosen and Japan. It was first taken in the United States at Chestnut Hill, Pa., in 1925, and 13 years later it was found attacking white pine in Morristown and Somerville, N. J. Further records obtained in 1937 and 1938 have shown that the species is widely distributed throughout the northern half of New Jersey and that it occurs in Rockland and Orange Counties, N. Y., and in Monroe, Northampton, and Bucks Counties, Pa. The insect has been found to attack red, white, mugho, Swiss Mountain, Scotch, Japanese red, and Austrian pine in the United States. Red and white pine appear to be the most favored and Austrian pine the least. Although reported as attacking Larix, Picea, and Abies in Europe, this sawfly has not yet been found to do so in the United States, despite the close proximity of trees of these genera to a heavily infested area. (C. W. Collins, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

A PINE SAWFLY

Infestations of Neodiprion sertifer Geoff., a European sawfly, apparently are increasing in intensity in New Jersey. Severe defoliation occurred in plantations of red pine, and on small groups of Japanese red, Scotch, jack, and mugho pine in Somerset County, whereas white pine and Austrian pine were fed upon rather sparingly, even when growing in close proximity to the heavily infested species. In New Jersey infestations are known to occur in Hunterdon, Mercer, Middlesex, Morris, Somerset, and Union Counties, and, although considerable scouting was done in 1938, the species was not found outside of these counties. J. S. Houser reported this species as a serious pest of Scotch pine in Ohio in 1938. There is also a record of this sawfly from Grayling, Mich., based on larval identification. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

SAWFLY ON RED PINE

Although the sawfly Neodiprion sp. on red pine did not cause as much defoliation in Massachusetts in 1938 as was anticipated early in the season, it still continues as a serious menace to red pine stands in New England. In Massachusetts many plantations of red pine on State forests, parks, State and municipal water-

sheds, and on private property were sprayed to prevent serious defoliation. Heavy infestations where serious defoliation occurred were observed in Essex, Middlesex, and Worcester Counties, Mass., and at Pittsford, in Rutland County, Vt.; also a medium infestation at Keene, in Cheshire County, N. H. (J. V. Schaffner, Jr., Bureau of Entomology and Plant Quarantine, U. S. D. A.)

BOXELDER LEAF ROLLER

A severe epidemic of what apparently is the boxelder leaf roller (Gracilaria sp., probably G. negundella Chamb. --- based on larval determinations) occurred throughout the southern portion of Idaho, where practically every boxelder was severely infested. Associated with this insect in many instances was a large noctuid that has been determined as Acronicta americana Harr. (J. C. Evenden, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

A NEW PINE NEEDLE MINER

A new needle miner, Recurvaria sp., was found attacking pinon pine east of Mono Lake, Calif. An area of about 10,000 acres was suffering from an epidemic infestation that had already caused death of the stand over about 3,000 acres. This infestation has attacked a pinon forest which for many years has been used by the Mono Indians for gathering pine nuts. (J. M. Miller, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

EUROPEAN PINE SHOOT MOTH

The infestations of the European pine shoot moth continue heavy in Westchester County and on Long Island, N. Y., and in the southwestern part of Connecticut, particularly on red and Scotch pine. Many red pine trees in plantations and in small ornamental groupings are in a very poor condition. (J. V. Schaffner, Jr., Bureau of Entomology and Plant Quarantine, U. S. D. A.)

NANTUCKET PINE SHOOT MOTH

The Nantucket pine tip moth was reported killing many of the new growth shoots on pine in plantations in parts of Kentucky, Tennessee, and Mississippi. It was also reported infesting pine adjacent to the Forest Service nursery near Licking, Mo. (L. G. Baughofer, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

WHITE GRUBS

White grubs (Phyllophaga spp.) caused heavy losses of seedlings in several forest nurseries in 1938. The Forest Service nurseries on the Nicolet National Forest, Wis., and Chippewa National Forest, Minn., had serious grub problems. Also on the Chippewa Forest one pine plantation of about 60 acres, established in 1937, suffered a mortality of about 80 percent, owing to grubs. The State nurseries in South Carolina had about two-thirds of the seedlings destroyed in some sections, and greater grub damage was prevented by chemical control measure. An outbreak of white grubs in the State nursery at Albany, Ga., was controlled by the use of carbon disulphide. (Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

SEED CORN MAGGOT

An infestation in the red cedar seedbeds of the Bureau of Agricultural Economics nursery near Lebanon, Tenn., caused some loss of young seedlings and considerable concern early in the spring of 1938. Root damage, by what was later found to be this insect, was first investigated in this nursery late in the spring of 1937, after the insects had disappeared from the beds. (B. H. Wilford, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

A CECIDOMYIID INJURING RHODODENDRONS

In Rhode Island some nurserymen grow rhododendrons from seed and when the plants are 3 years old known varieties are grafted on to their roots. These plants are forced in coldframes and nursery beds and usually put on two or three sets of new sprouts and leaves each year. Beginning with the second set of tender leaves late in June or early in July, a great amount of injury was caused by the larvae of an unidentified cecidomyiid. The tender leaves turn black and dry up or are badly deformed, and there is considerable retardation of growth. There is an overlapping of generations of the insect during the summer, and apparently it is hibernating as a full-grown larva in the soil. (J. V. Schaffne Jr., Bureau of Entomology and Plant Quarantine, U. S. D. A.)

MATSUCOCCUS SCALE

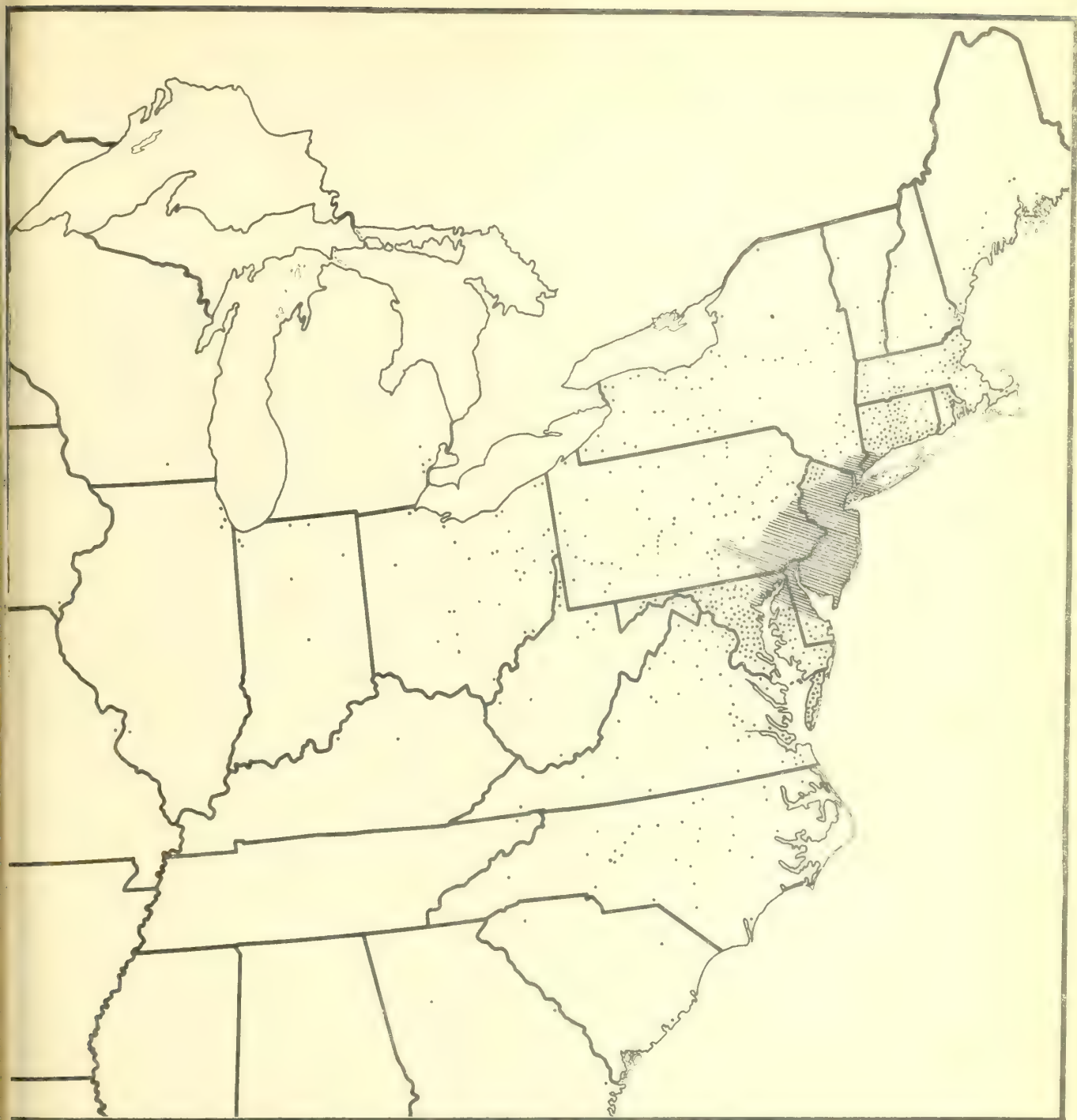
Observations during the last 2 years (1937-38) on Matsucoccus sp. on pitch pine in the Northeastern States indicate that populations of the insect have increased in the areas inspected. Analyses of data from pitch pine plots in Pennsylvania show that large numbers of twigs and leaders, and in some instances whole trees, have been killed by the insect. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

EUROPEAN EARWIG

Records of 1938 show that Forficula auricularia L. is becoming widely dispersed in southern New England. First found in Newport, R. I., many years ago, it is now known to occur in Fall River, New Bedford, and Taunton, Mass., and in Connecticut it was recently found at New Haven by W. E. Britton. (R. C. Brown, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

JAPANESE BEETLE

The winter of 1937-38 was one of the mildest in years throughout the present area of general distribution of the Japanese beetle. As a result, so far as could be determined, there was no appreciable winter mortality of the overwintering stage of the beetle. In the spring of 1938 an unusually warm early period was followed by a cooler period in May and June, as a result of which the rapid early season larval development was slowed down to such an extent that general emergence of adult beetles was somewhat later than normal. Weather conditions during July and early in August were exceedingly favorable for the adult stage of the beetle; the succession of cloudy days with frequent rains prolonged the normal summer life period of the beetle population so that the natural drop in population, owing to the dying off of the beetles, which customarily becomes appreciable early in August, was delayed for approximately 2 weeks. For the same reason, the normal beetle-feeding period was correspondingly prolonged. On the



POINTS AT WHICH JAPANESE BEETLES
HAVE BEEN RECOVERED.



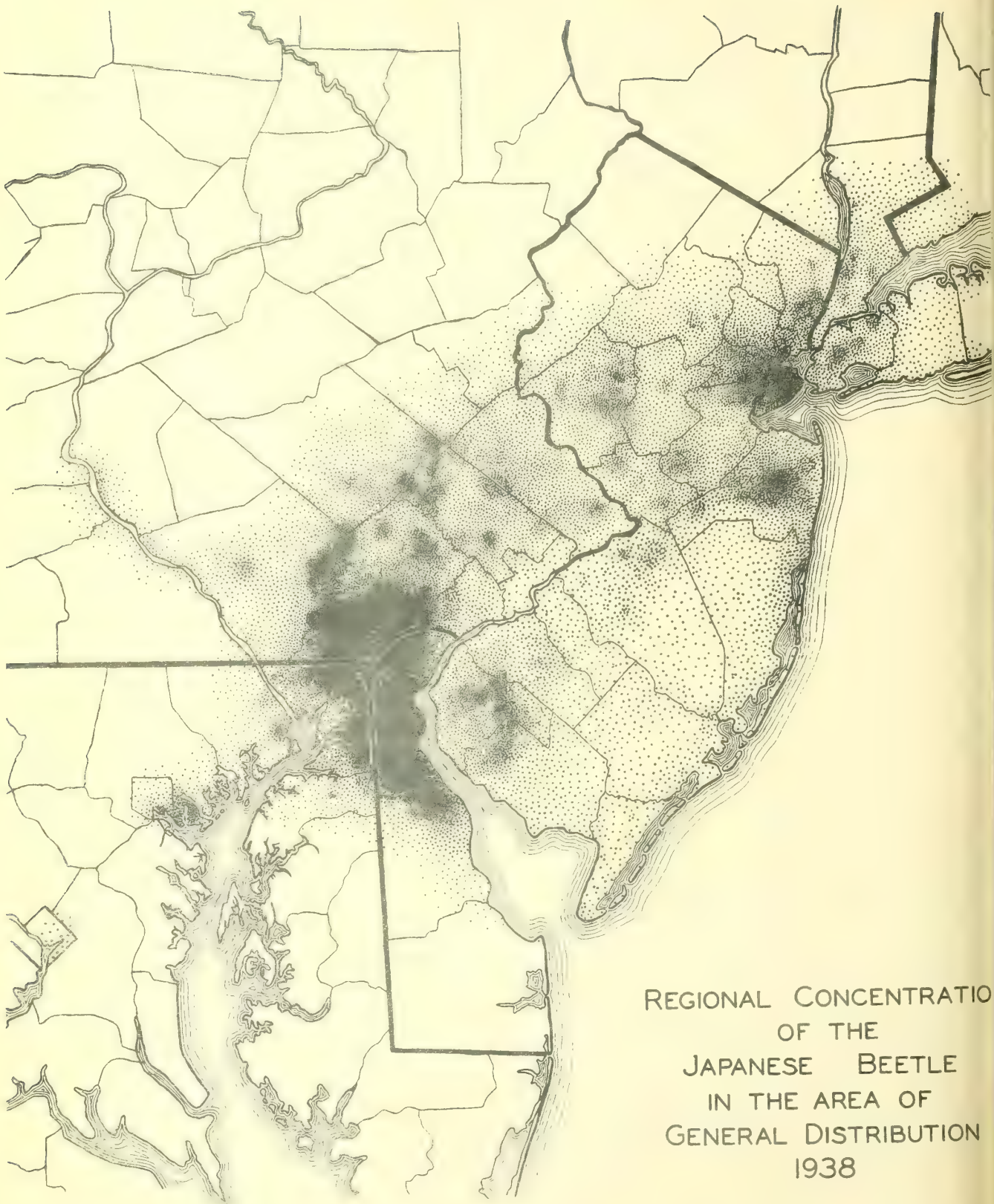
AREA CONTINUOUSLY INFESTED BY NATURAL SPREAD.



LOCALIZED COLONIES OR POINTS OF MINOR OCCURRENCE.







REGIONAL CONCENTRATION
OF THE
JAPANESE BEETLE
IN THE AREA OF
GENERAL DISTRIBUTION
1938

other hand, there is some evidence that the unusual prolonged heavy precipitation during the latter part of July resulted in the partial destruction of early laid eggs, as well as interrupting and prolonging the oviposition period. As a result, early fall larval development was somewhat delayed, but the mild late fall permitted larval development to progress so that at the time of entrance of larvae into hibernation, larval development was about normal.

At the close of the 1938 beetle season, the area of general distribution was estimated to cover approximately 15,117 square miles, an increase of 1,266 square miles over that of the previous year. This area was distributed among the various States as follows: Delaware, 1,043 square miles; Maryland, 1,157; Pennsylvania, 4,534; New Jersey, 7,227; New York, 993; and Connecticut, 163. The following points roughly define the limits of the area of general distribution: Lewes and Milford, Del.; Barclay and Baltimore, Md.; Delta, Harrisburg, Manheim, Hamburg, and Portland, Pa.; Andover and Pompton, N. J.; Suffern and Peekskill, N. Y.; and Ridgefield and Westport, Conn. The area of isolated colonies includes the States of Georgia, South Carolina, North Carolina, West Virginia, Ohio, Indiana, Illinois, Michigan, and the States to the east thereof. In this area the colonies or points of infestation are for the most part of a minor character, quite localized, and widely separated. The areas of general distribution and of isolated colonies are shown on the accompanying map.

As in previous years, the regional concentration of beetles varied throughout the area of general distribution, as shown by the accompanying maps. The infestation was heaviest, and decidedly heavier than in 1937, throughout the greater part of this area lying in Delaware and Maryland and in Chester and Delaware Counties in southeastern Pennsylvania. Within this area, one fairly continuous tract, estimated at 900 square miles, was generally characterized by an exceptional extent of severe foliage injury. The outstanding feature of this tract was the unusually high percentage of apple orchards approaching complete defoliation, while injury to shade trees, such as elms, planes, and oaks, was much more general and severe than normally encountered. There was also an area of very heavy beetle concentration, surrounding and including both metropolitan and suburban New York City, at many points in which area beetles were numerous enough to cause severe foliage injury. Throughout the remainder of the area of general distribution, comprising the greater part of New Jersey and eastern Pennsylvania, the infestation was not generally as heavy as in 1937, except in restricted tracts. However, during the 1938 season infestations heavy enough to cause obvious tree injury were present in approximately 7,310 square miles, or nearly half of the entire area considered generally infested.

In New England there was in 1938 a general increase in beetle abundance at the isolated colony sites in the more southern part of the range in Connecticut, Massachusetts, and Rhode Island. The natural dispersion of the insect has now carried it into the southwestern corner of Connecticut, where it may be expected to eventually fuse with developing local colonies. In 1938 several heavy but restricted infestations were found for the first time in the Berkshire area in southwestern Massachusetts. In the more northern portion of the range of the insect in New England, there has been little if any increase this year, while at some sites in New Hampshire beetles appear to have been somewhat scarcer than in previous years.

ASIATIC GARDEN BEETLE

No general scouting has been carried on this year to determine the spread and abundance of the Asiatic garden beetle, but observations during the active season in July and August indicate a more or less general increase in numbers this year in Connecticut, on Long Island, and in infested portions of northern New Jersey. This is the first time in several years that this upward trend has been noted. In the infested areas in eastern Pennsylvania and in west-central New Jersey beetles were fully as abundant this year as last.

The Japanese weevil (Calonycterus setarius Roelofs) first recorded from the United States in New York in 1929, was recorded from Connecticut in 1932, from Pennsylvania and Maryland in 1935, and was found in Massachusetts for the first time in 1933. During the season of 1938, this weevil was also reported from Connecticut, Maryland, and Pennsylvania.

Dialeurodes chittendeni Lainz was reported from Connecticut for the first time in 1938. It was abundant in a planting of rhododendron at Greenwich. It was also found during the season in Los Angeles County, Calif., on mountain laurel which had originated in Tennessee. The insect had previously been recorded from New York, Pennsylvania, Maryland, West Virginia, Tennessee, and Washington.

ROSE MIDGE

During the last 2 or 3 years, the rose midge, known chiefly as a serious pest of greenhouse roses since 1886, has suddenly appeared as a serious threat to garden roses. Its occurrence on out-of-door roses has been rare and unusual, the earliest record in this country being that by Dr. G. C. Hewitt in a garden at London, Ontario (Dom. Ent. Rept. 1915, p. 33). Apparently the first record of its occurrence on garden roses in the United States was in 1916, reported by C. R. Crosby and M. D. Leonard, and published in the First American Rose Annual for 1916. No further references appeared in literature from that time until 1935, when this pest was reported as injuring garden roses in a number of localities, viz., Grand Rapids, Mich.; Elyria, Ohio; Clifton Springs, Buffalo, and Long Island, N. Y.; Indianapolis, Ind. (July 1937); and Roanoke, Va. (1937). Some of these reports indicated that the infestations were of 2 or 3 years' standing. During the summer of 1938, an infestation at Woodridge, D. C., was discovered. Information received from members of the American Rose Society indicates that serious trouble was experienced during the past season in localities where it has become established. The indications are that this insect is on the ascendancy and may become a real menace to the successful growing of garden roses. On garden roses the midge causes the same type of injury as it does on roses grown under glass. The new shoots, including the flower and leaf buds are attacked as soon as they develop. Such new growth becomes distorted and later turns brown and dies. As a result, no flowers are produced on infested plants. The first crop of flowers may escape attack but thereafter, i.e., from the middle of July and extending throughout the season until frost, the injury continues. All kinds of roses are subject to attack. (C. A. Weigel, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

A root weevil, Pachyneus opalus Oliv., was bred on beans in Florida. This seems to be the first record of this insect from a leguminous plant.

Monotoma parallela Lec. was collected in cereals in Kansas in 1934 and reported this year. This appears to be the first record of this insect in stored cereal products.

Specimens recently identified by C. T. Green as Phytonyza atricornis Meig. were reared from mines in leaves of Cynara scolymus (artichoke) at Half Moon Bay, Calif., by W. H. Lange. This appears to be the first host record for this species.

SCREWORMS

Observations during the winter of 1937-38 showed that the screwworm fly (Cochliomyia americana C. and P.) survived this period in its normal overwintering area in the southern, southwestern, and southeastern parts of the United States. However, there was no evidence indicating that the fly was able to build up any considerable winter population and that there would be an unusual outbreak in or an extensive migration of the pest to more northern areas during the following spring and summer months. Throughout the season in the Southwest, where the fly overwintered, the population appeared not to be above that of the preceding 2 years. In the eastern section of the Edwards Plateau in Texas the number of screwworm flies increased enormously following heavy rains in July, with a consequent heavy infestation of range livestock. During the early part of the summer conditions were apparently favorable for the migration of the insect from Texas northward, either by natural dissemination or by the shipment of infested animals. This resulted in a rather general but not unusually severe outbreak of the fly in Oklahoma; a relatively small number of infestations in a few counties in southwestern and western Arkansas, although heavy infestations were reported in Washington, Pike, Jefferson, Chicot, and Desha Counties; a rather severe outbreak in 27 counties along the southern border of Kansas; and serious outbreaks in Stark and Scott Counties, Ill.; from which counties the pest spread and caused a heavy incidence of cases in several adjoining counties.

In the Southeast screwworms appeared to be somewhat worse in Florida during 1938 than in 1937. In Georgia there was a general infestation over the State, the counties in the southern half being more severely affected than the others. South Carolina reported that the season of 1938 was the worst screwworm year that that State had experienced, the heaviest infestations occurring in Beaufort and Saluda Counties. From 5- to 20-percent infestation of livestock by screwworms was reported in a few counties in southeastern Alabama, other counties in that section of the State reporting 1- to 2-percent infestation or less.

AMERICAN DOG TICK

In the Eastern States reports reaching the Bureau of Entomology and Plant Quarantine indicated that adults of Dermacentor variabilis Say, transmitter of Rocky Mountain spotted fever, appeared earlier in the season than in 1937; also that this species was considerably more numerous throughout its entire range. Three new locality records of the occurrence of this tick were recorded by the Bureau for Virginia. Seven additional records of the appearance of the tick in Nebraska, the first obtained since 1911, and two records of its occurrence in New Hampshire, the first since 1936, were obtained. In general, there appeared

to be no increase over 1937 in the number of spotted fever cases caused by the bites of this tick in the eastern area, but apparently the disease was reported for the first time in Mississippi in 1938. (E. C. Cushing, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

NEW RECORDS OF INSECTS

A mite, Penthaleus major Duges, was first taken by E. O. Essig on March 17 1922, near San Jose, Calif., where it was attacking the springtail Achorutes armatus Nicolet, swarming on the surface of fresh water in a drainage ditch. Specimens were sent to H. E. Ewing, who identified them as Penthaleus sp. In the same month L. R. Cody called Dr. Essig's attention to injuries to peas growing along the foothills near Warm Springs, Alameda County, Calif., by what appeared to be this species. The damage was considerable, but was restricted and for only a short time. A similar infestation recurred the following year, but none has been observed since. In July 1938 a small lot of the same species was collected by A. J. Nicholson at Riverside. A mounted slide of the mite was sent to H. Womersley, Adelaide, Australia, by Dr. Essig. In a letter dated July 13, 1938, Mr. Womersley states that the species is identical with the pea mite of that country, P. major Duges.

A single male moth, Laspeyresia coniferana Ratz. (det. by C. Heinrich), reared from larvae boring in the bark of white pine at Hartsdale, N. Y., is the second American specimen of this European species to be received. The first specimen was recorded from Croton River, N. Y., on June 27, 1934. Apparently the species is well established in Westchester County.

A European leafhopper, Athysanus schenki Kirsch. (det. by P. W. Oman), not previously reported from America, was collected in abundance in the Pacific Northwest in 1935. Material in collections reveals the following American records for the species: (1) Idaho: Moscow, Sept. 30, 1927 (Schull); Moscow, Oct. 21, 1929 (Gillett); Moscow Mountain, Sept. 14, 1931 (Gillett); Coeur d'Alene, July 9, 1935 (Oman); Cataldo, July 9, 1935 (Oman). (2) Washington: Ritzville, July 8, 1935 (Oman); south of Spokane, July 9, 1935 (Oman). (3) Oregon: Mt. Hood (post office), July 3, 1935 (Oman).

One specimen, Tarachidia heonix Dyar (det. by J. F. G. Clarke), a species of Noctuidae from Brewster County, Tex., is the first individual of this species recorded from the United States. In addition to the above specimen, there are in the National Museum the type and two other specimens, all from Mexico.

European longhorn beetles, Stromatium fulvum Villiers (det. by W. S. Fisher), were reported as having emerged from the woodwork of a living room in Camden, N. J. This beetle has not been known to have become definitely established in the United States.

Specimens of Diprion frutetorum (F.) (det. by Grace A. Sandhouse) from Lamination, N. J., was taken in litter under red pine. This apparently represents the first identification of the species from the United States, although one specimen in the National Museum labeled as being from Ithaca, N. Y., and another from Rye, N. Y., are evidently the same. These were taken in 1931 and at that time were identified by W. Middleton as Diprion sp. The species has been known in Canada since 1934, in the Niagara Falls area.

The oriental rat flea (Xenopsylla cheopis (Rothschild)), the chief transmitter of bubonic plague to man, has for many years been known to occur in the warmer port cities of the United States but it has been thought that the colder climate of the interior would probably prevent its development there. Nevertheless, in 1934 it was found at Ames, Iowa, and in 1936 at St. Paul, Minn., and H. E. Ewing and Irving Fox now record it from two additional inland and northern localities, namely, Urbana, Ill., and Youngstown, Ohio.

Trachyphloeus bifoveolatus Beck (det. by L. L. Buchanan), a weevil previously recorded from only two or three localities in the Eastern States, was recently found in abundance on the porches of houses and, to a lesser extent, indoors at Portland, Oreg.

Two specimens of Muscina pabulorum (Fall.) (det. by D. G. Hall), a relatively uncommon European species, were collected during the past fall in the vicinity of Boston, Mass., by Richard Dow, Curator, Boston Society of Natural History. This is the first North American record for the species.

Ants, Eciton (Labidus) caecum (Latr.) (det. by M. R. Smith), were collected on July 8, 1938, at Menard, Tex., by Roy Melvin, who reported that they were attacking newly emerged adults of the primary screwworm (Cochliomyia americana C. and P.).

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<i>Acronicta americana</i> (Harr.)-----	10	679
<i>Acrosternum hilare</i> (Say)-----	8	542, 547
	9	598
<i>Adalia bipunctata</i> (L.)-----	4	179
<i>Adelphocoris rapidus</i> (Say)-----	6	361
	7	490
	8	557
<i>Aedes aegypti</i> (L.)-----	8	570-571
	9	620
<i>Aedes aldrichi</i> Dyar and Knab-----	3	134
(changed to <i>Aedes lateralis</i> (Meig.))		
	4	217
<i>Aedes cantator</i> (Coq.)-----	5	307
<i>Aedes cinereus</i> Meig.-----	7	506
<i>Aedes dorsalis</i> Meig.-----	5	307
<i>Aedes sollicitans</i> (Walk.)-----	3	134
	5	307
	6	378
	7	506
	8	570
	9	620
<i>Aedes</i> spp.-----	3	134

<i>Aedes taeniorhynchus</i> (Wied.)-----	6	378
<i>Aedes varipalpus</i> (Coq.)-----	3	134
<i>Aedes vexans</i> Meig.-----	3	134
	4	217
	7	506
	9	620
<i>Aeoloplus turnbullii</i> (Thos.)-----	6 (Sup.)	394, 396, 398, 401, 403 409, 411, 413, 415, 431 432, 433, 439, 442, 443 398, 419, 423, 429
<i>Aeoloplus turnbullii bruneri</i> Caud.-----	6 (Sup.)	94
<i>Aeolus amabilis</i> (Lec.)-----	3	450
<i>Aeolus dorsalis</i> Say-----	7	156
<i>Aeolus elegans</i> F.-----	4	409, 419
<i>Aerochoreutes carlinianus</i> Thos.-----	6 (Sup.)	394, 398, 407, 413 419, 429, 439
<i>Aeropedellus clavatus</i> Thos.-----	6 (Sup.)	61
<i>Agallia sanguinolenta</i> (Prov.)-----	2	617
<i>Agathodes signalis</i> Guen.-----	9	390, 394, 398, 399 400, 401, 403, 404, 413 415, 417, 423, 426, 429 431, 432, 433, 435, 439 442, 443
<i>Ageneotettix deorum</i> (Scudd.)-----	6 (Sup.)	626, 627
<i>Agonum maculicolle</i> Dej.-----	9	208
<i>Agrilus anxius</i> Gory-----	4	295
	5	366
	6	494, 495
	7	523, 560
	8	562
<i>Agrilus bilineatus</i> (Web.)-----	8	610
	9	213
<i>Agrilus coeruleus</i> Rossi-----	4	179
<i>Agrilus ruficollis</i> (F.)-----	4	146
<i>Agriolimax agrestis</i> L.-----	3 (Sup.)	544
<i>Agriotes mancus</i> (Say)-----	8	133
<i>Agromyza pusilla</i> Meig.-----	3	145
<i>Agrotis c-nigrum</i> (L.)-----	3 (Sup.)	153
(changed to <i>Graphiphora c-nigrum</i> (L.))	4	246, 247
	5	91, 92
<i>Agrotis unicolor</i> (Walk.)-----	3	153
	4	246
	5	145
<i>Agrotis ypsilon</i> (Rott.)-----	3 (Sup.)	152
	4	247
	5	125
<i>Alabama argillacea</i> (Hbn.)-----	3	148, 202
	4	290
	5	358, 359
	6	447, 486, 488
	7	520, 552, 553, 555
	8	605, 607, 608
	9	671, 672
	10	

<i>Aleurothrixus howardi</i> (Quaint.)-----	6	343
	7	472
<i>Aleyrodidae</i> -----	2	76
	3	132
	5	287
	8	557
<i>Alsophila pometaria</i> (Harr.)-----	4	205-206
	5	243, 292
<i>Altica ignita</i> Ill.-----	6	373
<i>Altica</i> sp.-----	3	114
<i>Alydus eurinus</i> (Say)-----	8	533
<i>Alydus pilosulus</i> H. S.-----	8	533
<i>Alypia octomaculata</i> (F.)-----	4	207
	5	271
	6	341
	8	539
<i>Amblyomma americanum</i> (L.)-----	5	309
	6	315, 380
	8	573
<i>Amblyomma maculatum</i> Koch-----	2	82
	4	219
	5	309
	7	509
	9	623
<i>Ampelogypter ater</i> Lec.-----	5	271
<i>Amphitornus coloradus</i> (Thos.)-----	6 (Sup.)	394, 401, 409, 413 419, 423, 429, 431, 432 439, 443
		340
<i>Amphrophora rubi</i> Kltb.-----	6	594
	9	8
<i>Anabrus simplex</i> Hald.-----	1	51, 54
	2	87, 91
	3	147, 151
	4	241, 246
	5	313, 320, 324-325
	6	394, 439
	6 (Sup.)	449
	7	519, 526
	8	660-661
	10	
<i>Anacamptis fragariella</i> Busck-----	5	285
	9	604
<i>Anacentrinus subnudus</i> Buchanan-----	3	140
	5	260
<i>Anaphothrips obscurus</i> (Mull.)-----	5	306
<i>Anarsia lineatella</i> Zell.-----	4	177
	7	467
<i>Anasa tristis</i> (Deg.)-----	2	71
	4	192
	5	282-283
	6	352
	7	481-482
	8	548

Ancylis comptana (Froel.)-----	3	120
	4	197
	5	284-285
	6	354
Ancylis platanana Clem.-----	8	565
Andricus clavulus O. S.-----	1	22
Andricus punctatus Bass.-----	1	22
	2	75
	3	127
Anisolabis maritima Bonelli-----	8	576
Anisota rubicunda (F.)-----	6	368
	7	497-498
	8	561
Anisota senatoria(A. & S.)-----	7	498
	8	558, 561
Anobium punctatum Deg.-----	1	31
Anomala orientalis Wtrh.-----	4	157
	8	519, 526
Anopheles crucians Wied.-----	2	79
Anopheles punctipennis (Say)-----	1	27
	9	620
Anopheles quadrimaculatus (Say)-----	2	79
	3	134
	6	378
Anopheles spp.-----	8	571
Anoplonyx laricis Marlatt.-----	8	521
Anthonomus eugenii Cano.-----	1	1, 20
	4	198
	6	354
	7	446, 484
	9	604
Anthonomus grandis Boh.-----	2	73
	3	89, 122-123
	4	148, 200-201
	5	242, 288-289
	6	356-357
	7	447, 485-486
	8	551-552, 556
	9	580, 605-606
	10	671
Anthonomus grandis thurberiae Pierce-----	9	606
Anthonomus scutellaris Lec.-----	5	270
Anthonomus signatus Say-----	2	72
	3	119-120
	4	196-197
	5	285
Anthrenus vorax Wtrh.-----	7	512
Anticarsia gemmatilis (Hbn.)-----	6	332
	7	450
	9	590
Antipus laticlavaria Foerst.-----	5	306
Anuraphis cardui (L.)-----	2	67
	6	340

Anuraphis maidi-radiciis (Forbes)-----	4	203-204
Anuraphis persicae-niger (Smith)-----	1	14
	3	109
	4	177-178
	5	268
Anuraphis roseus Baker-----	2	64, 65
	3	107
	4	148, 173-174
	5	264
	6	314, 335-336
	9	592
Anuraphis viburnicola (Gill.)-----	4	216-217
(Changed to Aphis viburnicola Gill.)		
Apanteles schizurae Ashm.-----	6	342-343
Apanteles sp.-----	9 (Sup.)	635
Apanteles thompsoni Lyle-----	9 (Sup.)	635
Aphelinus mali Hald.-----	8	523
Aphiidae-----	1	13, 19
	2	64, 70-71
	3	88, 106-107, 119
	4	161, 173-174, 197, 203
		-204, 216
	6	314, 361-362
	7	447, 469, 490-491
	9	592, 608
Aphis abietina Walk.-----	4	212
Aphis forbesi Weed-----	1	19
	4	197
	7	484
Aphis gossypii Glov.-----	4	204
	5	283
	6	353
	7	483, 491
	8	549
	9	603
Aphis illinoisensis Shim.-----	7	469
Aphis maidis Fitch-----	6	331
	7	446, 459
	8	520, 531
Aphis medicaginis Koch-----	2	68
	3	101
	4	203
Aphis pawneepae Hottes-----	3	129
Aphis pomi Deg.-----	2	64, 65
	3	107
	4	173
	6	336
	9	592
Aphis rumicis L.-----	4	217
	5	281
	6	350
	7	479
	8	547

Aphis spiraeicola Patch-----	1	2,15
	2	52,67
	4	181
	5	273
Aphis viburniphila Patch-----	3	133
Aphodius denticulatus Hald.-----	10	661
Aphrophora parallela (Say)-----	4	211
	5	300
Aphrophora permutata Uhl.-----	4	186
Aphrophora spp.-----	5	300
Apote notabilis Scudd.-----	6	325
Argas miniatus Koch-----	4	220
	8	574
	9	624
Argyresthia freyella Wlsm.-----	4	214
Argyresthia thuieiella (Pack.)-----	4	214
Argyroploce abietana Fern. See Taniva albolineana Kearf.		
Argyrotaenia citrana (Fern.)-----	6	343
Argyrotaenia pinatubana (Kearf.)-----	1	22
	3	128
	4	211
Argyrotaenia velutinana (Walk.)-----	3	106
	6	373
	7	505
Argyrotoxa semipurpurana Kearf.-----	6	369
Armadillidium vulgare Latr.-----	7	513
Arphia conspersa Scudd.-----	6 (Sup.)	423
Arphia pseudonietana (Thos.)-----	6 (Sup.)	394, 398, 405, 406 407, 409, 417, 418, 419 429, 435, 439
Arphia simplex Scudd.-----	6 (Sup.)	423
Arphia sulphurea (F.)-----	6 (Sup.)	423
Arphia xanthoptera (Burm.)-----	3	90
Artipus texanus Pierce-----	8	570
Aspidiotus comstocki Johns.-----	6	369
Aspidiotus destructor Sign.-----	2	68
	4	182
	8	540
Aspidiotus hederæ (Vallot)-----	1	26
Aspidiotus howardi Ckll.-----	8	534
Aspidiotus juglans-regiæ Comst.-----	2	75
	5	298
Aspidiotus lataniae Sign.-----	1	26
Aspidiotus perniciosus Comst.-----	1	1,13
	2	62-63
	3	103
	5	261
	6	333-334
	7	462
	8	535
	9	579, 591
Asterolecanium bambusae Bdv.-----	8	567

Asterolecanium miliaris Bdv.-----	8	567
Asterolecanium variolosum Ratz.-----	1	22
	7	498
	8	562
Athous pallidipennis Mann.-----	4	156
Athysanus schenki Kirsch.-----	10	684
Atta septentrionalis obscurior seminole Wheeler	7	471
Atta sp.-----	7	471
	9	591
Aulocara ellioti Thos.-----	6 (Sup.)	390, 394, 396, 398 399, 401, 403, 407, 409 411, 412, 413, 415, 417 419, 421, 422, 423, 426 427, 429, 431, 432, 433 434, 435, 439, 443
Aulacaspis pentagona (Targ.)-----	4	216
	6	374
	7	502
	8	566
Aulacaspis rosae (Bouche)-----	3	110
	6	377
Autographa brassicae (Riley)-----	2	76
	3	117
	6	351
	7	480
	8	547
	9	602
Autographica californica (Speyer)-----	2	56
Autoserica castanea (Arrow)-----	4	158
	6	314, 322
	7	445, 452
	8	519, 526
	10	682
Bassus agilis Cress.-----	9 (Sup.)	650, 651, 654
Bathyplectes curculionis Thoms.-----	1	11
	1 (Sup.)	33, 35-50
	2	61
	3	100
	4	166
Battaristis vittella Busck.-----	4	211
Bembecia marginata (Harr.)-----	3	110
	8	539
	9	594
Blastophaga psenes L.-----	3	112
Blatta orientalis L.-----	2	85
	5	311
Blepharida rhois Forst.-----	3	129
	6	373
Blissus hirtus Montd.-----	3	130
	6	373-374
	7	447, 502
	9	616
Blissus insularis Barber.-----	7	447, 502

Blissus leucopterus (Say)-----	1	1,10
	2	51,57-58
	3	87,97-98
	4	147,160-161
	5	241,252-253
	6	314,330-331
	7	446,459
	8	531
	9	579,586
	10	658,660
Boopedon maculatum Caud.-----	6 (Sup.)	401,423
Boopedon nubilum Say-----	6 (Sup.)	394,401,409,413
		423,429
Boopedon sp.-----	6 (Sup.)	439
Bovicola bovis (L.)-----	2	82
Bovicola ovis (L.)-----	1	29
Bovicola spp.-----	4	221
Bovicola subrostratus Nitz.-----	6	381
Bourletiella hortensis (Fitch)-----	4	195
Brachyrhinus ovatus (L.)-----	5	285
	7	503
Brachyrhinus rugosostriatus Goeze-----	5	285
Brachyrhinus singularis L.-----	5	243
Brachyrhinus sulcatus (F.)-----	4	217
	5	306
	6	377
	7	503
Brachystola magna (Gir.)-----	6 (Sup.)	394,409,413,417
		423,429,439
	7	449
Brachystola sp.-----	6 (Sup.)	390
Bracon aticornis (Smith)-----	9 (Sup.)	635
Brevicoryne brassicae (L.)-----	3	118
	5	282
	6	351
	9	602
Bruchophagus gibbus (Boh.)-----	9	590
Bruchus brachialis Fahrneus-----	3	102
	5	260
	8	520,533
	9	579,590
	10	662-663
Bruchus mayri Masi-----	10	663
Bruchus pisorum (L.)-----	3	139
	4	224
	6	350
Bruneria brunnea Thos.-----	6 (Sup.)	409,419,439
Bryobia praetiosa Koch-----	2	86
	3	102
	4	163
Bucculatrix thurberiella Busck-----	9	608

Byturus unicolor Say-----	3	110
	4	179
	5	270
	6	340
Cacoecia argyrospila (Walk.)-----	3	106
	4	169
	5	263-264
	8	536
Cacoecia cerasivorana (Fitch)-----	4	180
Cacoecia fumiferana (Clem.)-----	5	299
	6	317, 368
	7	499
	8	521, 564
	10	676
Cacoecia rosaceana (Harr.)-----	8	536
Cacoecia semiferana Walk.-----	7	495
Calandra granaria L. <u>See</u> Sitophilus granarius(L.)		
Calandra spp.-----	7	460
Caliroa aethips (F.)-----	4	216
	5	306
	6	376
Calligrapha sigmoidea Lec.-----	5	304
Callimome druparum (Boh.)-----	6	336
Calliphora erythrocephala Meig.-----	1	31-32
Calocalpe undulata L.-----	2	55
Calomycterus setarius Roelofs-----	5	250
	7	445, 453
	10	682
Camnula pellucida (Scudd.)-----	4	149
	6 (Sup.)	386, 390, 391, 394
		404, 405, 407, 408, 409
		411, 412, 417, 418, 419
		421, 422, 429, 435, 436
		437, 438, 439, 442, 443
	8	519, 525
	9	581
Camponotus abdominalis floridanus Buckl.-----	8	574
Camponotus caryae discolor Buckl.-----	8	575
Camponotus caryae rasilis Wheeler-----	2	85
Camponotus herculeanus modoc Wheeler-----	4	223
Camponotus herculeanus pennsylvanicus (Deg.)	4	223
	6	381, 382
	7	510
Camponotus maculatus vicinus Mayr.-----	4	223
Camponotus sp.-----	9	625
Campoplex multicornatus Grav.-----	9 (Sup.)	635
Campoplex pyraustae Smith-----	9 (Sup.)	635
Campylacantha olivacea (Scudd.)-----	6 (Sup.)	417, 418
Capitophorus ribis (L.)-----	5	272

Carpocapsa pomonella (L.)-----	1	1,12
	2	52,63
	3	88,104
	4	148,170-172
	5	242,261-263
	6	314,317,334-335
	7	446,462-464
	8	520,523,535-536
	9	579,591-592
	10	665
Carpophilus hemipterus (L.)-----	5	311
Carpophilus pallipennis Say-----	7	505
Cathartus cassiae Reiche-----	9	589
Catorama sp.-----	4	223
Caulophilus latinasus Say-----	9	589
Cecidomyia robiniae Hald.-----	5	297
Cecidomyiidae-----	10	680
Celama sorghiella (Riley)-----	5	254
	7	461
	8	520,533-534
	9	590
Celerio gallii Rott.-----	7	484
Cephus cinctus Nort.-----	6	316
	8	522
Cephus pygmaeus (L.)-----	4	162
	9	586
Cerastipsocus venosus Burm.-----	7	512
Ceratitis capitata (Wied.)-----	6	384
Ceratomia catalpae (Bdv.)-----	5	295
	7	495
	8	560
Ceratophyllus gallinae Schr.-----	3	137
Cercopidae-----	3	120
	4	186
Ceresa bubalus (F.)-----	5	276
	6	333
Cerococcus sp.-----	1	26
Cerotoma trifurcata (Forst.)-----	3	116-117
	4	190-191
	5	280
	6	350
	7	461
	8	546
	9	600
Ceutorhynchus assimilis Pavk.-----	4	192
	7	480
Ceutorhynchus rapae Gyll.-----	4	192
Chaetocnema confinis Crotch-----	8	546
Chaetocnema pulicaria Melsh.-----	5	253
	7	460

Chalcodermus aeneus Boh.-----	1	11
	4	167
	5	281
	6	332
	7	461
	8	546
Chalcodermus collaris Horn-----	1	11
	4	167
	6	332
Chalepus dorsalis Thunb.-----	4	209
	5	297
	6	368
	7	497
	9	612
Chaborus sp.-----	9	620
Chelonus annulipes Wesm.-----	9 (Sup.)	629, 630, 632-635, 651 653, 655, 656
Chelysoma guttatum H. S.-----	8	542
Chermes abietis L.-----	1	23
	5	301
Chermes cooleyi Gill.-----	5	296
Chermes lariciatus Patch-----	6	371
Chermes pinicorticis Fitch. <u>See</u> Pineus strobi Htg.		
Chermes sp.-----	1	23
Chermes strobilobius Kltb.-----	5	297
Chilo simplex (Butl.)-----	6	384
Chilocorus cacti L.-----	4	182
Chionaspis americana Johns.-----	3	127
Chionaspis euonymi Comst.-----	2	77
	6	375
	7	504
	9	618
Chionaspis furfura (Fitch)-----	3	103
	6	365
	9	611
Chionaspis pinifoliae (Fitch)-----	1	23
	2	75-76
	7	500
	8	563-564
Chironomus spp.-----	3	135
	6	315, 378
Chloealtis conspersa Harr.-----	6 (Sup.)	407, 409, 429
Chlorion ichneumoneum L.-----	7	502-503
Chlorochroa sayi Stal-----	2	59-60
	6	316
Chorizagrotis auxiliaris (Grote)-----	2	51, 55
	3	87, 92, 93
	4	154
	5	246, 247

Chortippus longicornis Latr.-----	6 (Sup.)	394, 398, 399, 405, 406 407, 409, 413, 419, 429 435, 436, 437, 438, 439
Chortophaga spp.-----	1	8
	2	53
	3	90
Chortophaga viridifasciata (Deg.)-----	2	54
	3	90
	6 (Sup.)	423, 427
Chrysobothris femorata (Oliv.)-----	1	14
	3	107
	4	169
	6	333
	8	536
Chrysomela interrupta F.-----	7	501
Chrysomela lapponica L.-----	5	302
Chrysomela scripta F.-----	5	302
	6	371
	7	501
Chrysomela tremulae F.-----	6	371
	8	564
	9	610
	10	675
Chrysomphalus aonidum (L.)-----	1	25
	5	273
	7	471
	9	596
Chrysomphalus aurantii (Mask.)-----	1	15
(Changed to Aonidiella aurantii (Mask.))		
	3	131
	4	213
	7	471
	9	617
Chrysomphalus obscurus (Comst.)-----	6	369
Chrysomphalus personatus Comst.-----	1	32
Chrysomyza demandata F.-----	1	32
Chrysops callidus O. S.-----	6	380
Chrysops flavidus Wied.-----	6	380
Chrysops spp.-----	2	79
Cicadellidae-----	2	65
	3	109
	6	328
	9	619
Cimbex americana Leach-----	5	302-303
	6	367
	7	496
Cimex lectularius L.-----	9	624
Cimex pilosellus Horv.-----	7	506
Cinara strobili Fitch-----	9	614
Cirphis unipuncta (Haw.)-----	2	51, 57
	3	87, 91, 96-97
	4	147, 152-153, 159-160
	5	241, 251-252

Cirphis unipuncta (Haw.) Cont'd.-----	6	314, 316, 326-327
	7	445, 454
	8	522, 527
	9	583
	10	664, 665
Cnephasia longana (Haw.)-----	3	102
	4	186
	5	285
	9	597
Coccidae-----	8	540
Coccinella quinque-notata Kby.-----	4	174
Coccus hesperidum L.-----	3	110
	9	618
Cochliomyia americana C. & P.-----	1	2, 27
	2	80
	4	218
	5	307-308
	6	379
	7	508
	8	520, 571-572
	9	622
	10	683, 685
Cochliomyia macellaria (F.)-----	4	80, 218
	7	508
	9	622
Cochliomyia sp.-----	9	622
Colaspis brunnea (F.)-----	8	552
Colaspis pini Barber-----	6	370
Colaspis viridiceps Schaeff.-----	8	532
Coleophora caryaefoliella Clem.-----	6	342
	8	539
Coleophora fletcherella Fern.-----	4	181
Coleophora laricella Hbn.-----	2	75
	3	127
	4	209
	5	296-297
Coleophora malivorella Riley-----	4	173
	6	335
Coleoptera-----	3	130
Colletes rufithorax Smith-----	4	213
Coloradia pandora Blake-----	7	499
Coninomus constrictus Gyll.-----	7	512
Conoccephalus concinnum delicatum Brun.-----	6 (Sup.)	413
Conopia acerni Clem.-----	4	210
Conopia bibionipennis (Bdv.)-----	9	604
Conopia exitiosa (Say)-----	3	108
	4	177
	5	268
	7	467
	8	538
	9	579, 593
	10	667

<i>Conopia pyri</i> Harr.-----	4	178
<i>Conopia rhododendri</i> Beut.-----	9	619
<i>Conotrachelus affinis</i> Boh.-----	6	342
	7	469
<i>Conotrachelus anaglypticus</i> Say-----	6	375
<i>Conotrachelus nemuphar</i> (Hbst.)-----	1	2, 14
	2	52, 66
	3	108-109
	4	175-176
	5	266-267
	6	315, 338
	7	446, 465-466
	8	538
	10	667
<i>Conozoa carinata</i> Rehn-----	6 (Sup.)	390, 391
<i>Contarinia virginianae</i> Felt-----	6	365
<i>Cordillacris crenulata</i> Brun.-----	6 (Sup.)	390, 391, 394, 396
		401, 403, 404, 409, 413
		417, 419, 429, 433, 434
		439
<i>Cordillacris occipitalis</i> Thos.-----	6 (Sup.)	394, 398, 401, 409
		412, 413, 415, 419, 423
		429, 439
<i>Corizus sidae</i> (F.)-----	8	568
<i>Corythucha ciliata</i> (Say)-----	4	212
	7	501
<i>Corythucha cydoniae</i> Fitch-----	4	213
<i>Corythucha ulni</i> O. & D.-----	7	496
<i>Cosmopepla bimaculata</i> (Thos.)-----	8	543
<i>Cotalpa lanigera</i> L.-----	5	301
<i>Cotinis nitida</i> (L.)-----	2	73
	3	87, 95
	3 (Sup.)	145
	4	199
	6	322
	7	451
	9	584
<i>Crambus caliginosellus</i> Clem.-----	4	200
<i>Crambus</i> sp.-----	5	287
	6	373
<i>Cratypedes neglectus</i> Thos.-----	6 (Sup.)	409, 439
<i>Cremastus flavoorbitalis</i> (Cameron)-----	9 (Sup.)	635, 651, 654, 656
<i>Crematogaster near laeviuscula</i> Mayr-----	4	223
<i>Crematogaster lineolata</i> Say-----	6	382
<i>Creontiades debilis</i> Van D.-----	8	557
<i>Crioceris asparagi</i> (L.)-----	1	18
	3	118
	4	195
	5	283
	6	353
	7	483
	8	549
<i>Cryptococcus fagi</i> (Baer.)-----	4	208

Cryptolaemus sp.-----	5	273
Cryptorhynchus lapathi (L.)-----	5	302
(Changed to Sternochetus lapathi (L.))		
	8	565
	9	615
Culex pipiens L.-----	3	134
	6	378
	9	620
Culex spp.-----	7	506
Culex tarsalis Coq.-----	1	27
	3	134
Culicinae-----	2	79
	4	219
	5	307
	7	447, 506
	8	570-571
	9	620
Culicoides canithorax Hoff.-----	3	135-136
Culicoides spp.-----	2	52, 79
	3	135-136
Curculio caryae (Horn)-----	1	2, 20
	6	342
	7	470
	9	595
Cuterebra sp.-----	9	625
Cylas fornicarius (F.)-----	1	19
	3	120
	10	670
Cylindrocopterus adspersus Lec.-----	5	306
Cyllene robiniae (Forst.)-----	6	368
	8	561
Dactylotum pictum (Thos.)-----	6 (Sup.)	394, 413, 417, 419 423, 429, 439
	7	449
Daihinia brevipes Hald.-----	5	277
Dasyneura communis Felt-----	5	297
	7	497
Dasyneura leguminicola (Lint.)-----	9	590
Dasyneura mali (Kieff.)-----	5	266
Dasyneura pyri (Kieff.)-----	7	467
Dasyneura rhodophaga (Coq.)-----	10	682
Datana contracta Walk.-----	8	558
Datana integerrima G. & R.-----	2	67
	5	242, 272-273
	6	315, 372
	7	446, 470
	8	565
	9	615
Datana ministra (Drury)-----	6	335
	7	446, 462
	8	534, 558
Datana perspicua G. & R.-----	6	372

Datana sp.-----	7	500
Decticinae-----	6 (Sup.)	433
Deltocephalus inimicus Say-----	9	586
Dendroctonus brevicornis Lec.-----	9	530, 613
	10	674
Dendroctonus convexifrons Hopk.-----	10	674
Dendroctonus frontalis Zimm.-----	3	128
	7	447, 499
	9	613
	10	673
Dendroctonus monticolae Hopk.-----	10	674
Dendroctonus piceaperda Hopk.-----	8	564
	10	673
Dendroctonus ponderosae Hopk.-----	10	673, 674
Dendroctonus pseudotsugae Hopk.-----	10	674
Dendroctonus terebrans (Oliv.)-----	5	299
	9	613
Dendrothrips ornatus Jabl.-----	7	505
	8	569
Dermacenter albipictus (Pack.)-----	3	137
Dermacenter andersoni Stiles-----	3	136, 137
	5	243
Dermacenter sp.-----	6	381
Dermacenter variabilis (Say)-----	2	52, 80
	3	136
	4	221-222
	5	310
	7	447, 507-508
	8	571
	9	621
	10	683-684
Dermestes vulpinus F.-----	7	512
Derotmema haydenii Thos.-----	6 (Sup.)	394, 393, 401, 409
		413, 417, 419, 429, 439
Derotmema longipennis-----		
(An erroneous name; should have been Dissosteira longipennis)		
Desmia funeralis (Hbn.)-----	5	271
	7	468
	8	538-539
Diabrotica balteata Lec.-----	1	2, 16
	5	280
	6	345
	7	474
	8	520, 541-542
	9	601
Diabrotica duodecimpunctata (F.)-----	1	16-17
	2	69
	3	113-114
	4	184
	5	275
	6	330, 345, 346
	7	474
	8	541
	9	597, 616

Diabrotica longicornis (Say)-----	6	330
	7	460
Diabrotica soror Lec.-----	1	2, 17
	3	114
	4	184
	8	542
Diabrotica spp.-----	7	473-474
	8	541
Diabrotica trivittata (Mann.)-----	8	542
Diabrotica vittata (F.)-----	3	114
	4	194-195
	5	274-275
	6	316, 345-346
	7	473-474
	8	541
	9	597
Dialeurodes chittendeni Laing-----	3	89, 133
	10	682
Dialeurodes citri (Ashm.)-----	2	68
	3	111
	4	181
	5	273
	6	343
	7	470-471
	8	540
Dialeurodes citrifolii (Morg.)-----	5	273
	6	343
	7	470
Dialeurodes spp.-----	8	520, 540
Diaphania hyalinata (L.)-----	6	353
	7	482
	8	549
Diaphania nitidalis (Stoll)-----	5	283
	6	353
	7	482-483
	8	520, 548
	9	580, 603
Diapheromera femorata (Say)-----	6 (Sup.)	429
	8	520, 559
	9	610
Diapheromera velii Walsh-----	6 (Sup.)	429
Diarthronomyia hypogaea (Loew)-----	5	303
	6	374
Diaspis boisduvalii Sign.-----	1	26
Diaspis carueli Targ.-----	5	304
	6	376
	7	505
	8	569
	9	618
Diatraea cranbidoides (Grote)-----	7	461
Diatraea grandiosella Dyar-----	2	60
Diatraea saccharalis (F.)-----	1	12
	2	62
	3	102
	4	167

<i>Diatraea saccharalis</i> (F.) (Cont'd.)-----	5	260
	7	461
	8	534
	9 (Sup.)	629
<i>Dichomeris marginellus</i> F.-----	2	78
	6	376
	7	504
	8	569
<i>Dichromorpha viridis</i> (Scudd.)-----	6 (Sup.)	392, 393, 398, 413
<i>Dinoderus minutus</i> F.-----	3	139
<i>Diplopoda</i> -----	5	235-236
<i>Diprion frutetorum</i> F.-----	8	520, 562
	10	684
<i>Diprion polytomum</i> (Htg.)-----	6	317, 371
	8	523
	9	580, 615
	10	677-678
<i>Diprion simile</i> (Htg.)-----	5	300
<i>Dissosteira carolina</i> (L.)-----	8	315, 319
	6 (Sup.)	390-394, 398, 399, 401
		405, 407-409, 411, 413
		417, 419, 423, 427, 429
		435, 436, 439
	8	524
<i>Dissosteira longipennis</i> Thos.-----	1	0
	3	90
	4	147, 150
	5	245
	6	319
	6 (Sup.)	385, 386, 388, 389
		393, 394, 395, 397, 401
		403, 413, 416-418, 423
		429, 432, 433, 443
	8	519, 524
	9	582
	10	650
<i>Dissosteira spurcata</i> Sauss.-----	6 (Sup.)	435
<i>Doru aculeatum</i> (Scudd.)-----	7	461
<i>Doru lineare</i> (Esch.)-----	8	576
<i>Dorynrmox pyranicus flavus</i> McCook-----	8	574-575
<i>Drepanopterna femoratum</i> Scudd.-----	6 (Sup.)	394, 401, 403, 409
		413, 417, 419, 429, 433
		434, 435, 439
<i>Drosophila</i> sp.-----	1	32
	9	594
<i>Dysdercus suturollus</i> (H. S.)-----	7	490
	8	557
	9	508
<i>Ecdytolopha insiticiiana</i> Zell.-----	7	497
<i>Echidnophaga gallinacea</i> (Westw.)-----	3	137
	4	220
	8	574

<i>Eciton caecum</i> (Latr.)-----	10	685
<i>Ectopsocus</i> sp.-----	8	577
<i>Ehrhornia cupressi</i> Ehrh.-----	8	560
	9	611
<i>Elasmopalpus lignosellus</i> (Zell.)-----	4	185
	5	258
	7	446, 458-459
	8	543
	9	601
<i>Elateridae</i> -----	1	9
	3 (Sup.)	145
	4	155-156
	5	243, 248
	6	313, 320-321
	7	450
	9	583
<i>Eleodes opaca</i> (Say)-----	9	583
<i>Eleodes</i> spp.-----	9	579, 583
<i>Eleodes suturalis</i> Say-----	6	321
<i>Eleodes tricostata</i> Say-----	6	321
<i>Ellopiia fiscellaria</i> Guen.-----	8	521
<i>Ellopiia fiscellaria lugubrosa</i> Hulst.-----	7	493
	10	677
<i>Emphytus cinctipes</i> Nort.-----	9	604
(Changed to <i>Allantus cinctus</i> (L.))		
<i>Empoasca fabae</i> (Harr.)-----	3	88, 116
	4	189
	5	278
	6	315, 347-348
	7	476, 484
	8	533, 545
<i>Empria fragariae</i> Rohw.-----	5	285
<i>Encarsia formosa</i> Gahan-----	3	114-115
<i>Enchenopa binotata</i> Say-----	7	502
	9	616
<i>Encoptolophus pallidus subgracilis</i> Caud.-----	6 (Sup.)	423, 433
<i>Encoptolophus sordidus</i> (Burm.)-----	6 (Sup.)	417, 418
<i>Encoptolophus sordidus costalis</i> Scudd.-----	6 (Sup.)	394, 398, 401, 405-409
		413, 419, 439
<i>Encoptolophus sordidus sordidus</i> (Burm.)-----	6 (Sup.)	398, 405
<i>Ennomos subsignarius</i> (Hbn.)-----	5	292
	7	498
<i>Epargyreus tityrus</i> F.-----	6	368
<i>Ephestia cautella</i> (Walk.)-----	8	576
<i>Ephestia elutella</i> (Hbn.)-----	8	520, 550
	10.	670-671
<i>Ephestia figulilella</i> Greg.-----	9	594
<i>Ephestia kuehniella</i> Zell.-----	8	576
	9 (Sup.)	629
<i>Epicaerus formidolosus</i> Boh.-----	6	357
<i>Epicaerus imbricatus</i> (Say)-----	3	114
<i>Epicauta cinerea</i> (Forst.)-----	6	344, 345
	7	473

Epicauta lemniscata F.-----	6	344, 345
	7	473
Epicauta maculata (Say)-----	6	345
Epicauta marginata (F.)-----	7	473, 504
Epicauta pennsylvanica (Deg.)-----	5	275
	6	344
	7	473
Epicauta sp.-----	5	276
Epicauta vittata (F.)-----	5	275-276
	6	344, 345
	7	473
Epilachna borealis (F.)-----	4	193
	7	482
Epilachna varivestis Muls.-----	1	18
	3	88, 116
	4	148, 189-190
	5	242, 279-280
	6	348-350
	7	446, 477-479
	8	520, 545-546
	9	550, 600
	10	668
Epinotia aceriella Clem.-----	7	498
Epinotia meritana Heinr.-----	2	52, 75
Epitrix cucumeris (Harr.)-----	3	115
	3 (Sup.)	143
	4	188
	5	277-278, 287
	6	347, 355
	7	475-476
Epitrix parvula (F.)-----	1	20
	2	52, 72
	3	121
	3 (Sup.)	141-143
	4	199
	8	550
	9	605
Epitrix spp.-----	2	70
	7	475-476
Epitrix suberinita Lec.-----	3	116
	7	476
Erannis tiliaria (Harr.)-----	6	365
Eriocampoides limacina (Retz.)-----	5	269
(Changed to Caliroa cerasi (L.))		
	6	339
	7	467
	8	538
Eriococcus azaleae Const.-----	2	77
	3	133
	5	305
	7	503
	8	567

Euphoria sepulcharis F.-----	5	258
	8	531
Eurosta solidaginis Fitch-----	5	304
Eurymus eurytheme (Bdv.)-----	2	56
(Changed to Colias eurytheme Bdv.)		
	4	166
	8	532
	9	590
Euryophthalmus convivus (Stal)-----	6	340
Euschistus inflatus Van D.-----	5	286
Eusimulium clarum D. & S.-----	3	134-135
Eusimulium griseum Coq.-----	1	28
Eusimulium pecuarum (Riley)-----	1	28
	2	82
Eusimulium spp.-----	1	2, 28
	2	52, 82
Eutettix tenellus (Bak.)-----	2	72
	3	121
	7	476
	10	669-670
Eutrombidium trigonum Hermann-----	3	90
	7	448
Euxoa messoria (Harr.)-----	3 (Sup.)	145
	5	247
Evergestis straminealis Hbn.-----	9	602
Exeristes roborator F.-----	9 (Sup.)	635
Feltia annexa (Treit.)-----	2	55
	3	93
	5	246
Feltia ducons (Walk.)-----	4	153
Feltia gladiaria Morr.-----	2	55
	3	92
	4	152
	5	246
Feltia subgothica (Haw.)-----	2	55
	3 (Sup.)	145
	4	154
Feltia venerabilis Walk.-----	3	92
	4	154
	5	247
Fenusa punila Klug-----	7	495
Fiorinia theae Green-----	1	25
Forficula auricularia L.-----	4	186
	6	383
	7	511
	8	522, 575-576
	10	680
Formicidae-----	6	381-382
	8	574

Frankliniella fusca (Hinds)-----	3 (Sup.)	145
	4	200, 204
	5	287
	6	346
Frankliniella insularis Frankl.-----	5	281
Frankliniella tritici (Fitch)-----	3	124
	4	204, 212
	5	291
Galerucella xanthomelaena (Schr.)-----	3	127
	4	203-209
	5	295
	6	315, 366-367
	7	447, 495-496
	8	560
	9	611
	10	674-675
Gargaphia solani Heid.-----	5	353
	7	484
Gasterophilus haemorrhoidalis (L.)-----	5	310
Gasterophilus intestinalis (Deg.)-----	4	220
	5	310
	6	380
	8	573
Gasterophilus nasalis (L.)-----	5	310
	6	380
	7	509
Gasterophilus spp.-----	5	310
	9	624
Geometridae-----	1	2, 21
	2	52, 74-75
	3	89, 125
	4	205-206
	5	292
	9	609
Giardomyia sp.-----	9	619
Gibbium psylloides Czern.-----	3	139
Gnorimoschema lycopersicella (Busck)-----	1	2, 18
	4	189
	5	278
	8	544
	9	599
	10	669
Gnorimoschema operculella (Zell.)-----	5	278
	6	347, 354
	8	520, 544
	9	599-600
Goniurus proteus (L.)-----	9	601
(Changed to Urbanus proteus (L.))		
Gossyparia spuria (Mod.)-----	1	21
	4	209
	5	296
	6	367

Gracilaria azalocella Brants.-----	5	307
Gracilaria negundella Chamb.-----	10	1
Gracilaria sp.-----	10	679
Gracilaria syringella F.-----	4	215
Gracilia minuta F.-----	4	223
Grapholitha molesta (Busck)-----	1	14
	2	52, 65-66
	3	108
	4	176-177
	5	242, 267-268
	6	314, 317, 337-338
	7	446, 466-467
	8	523, 537
	9	593
	10	666-667
Grapholitha prunivora (Walsh)-----	8	534
Graptolitha antennata (Walk.)-----	4	172-173
	5	294
Gretchena bolliana (Sling.)-----	4	181
	5	273
Gryllidae-----	1	17
	3	121-122
	4	186-187
	7	475
Gryllotalpa hexadactyla Perty-----	3	115
	4	187
	6	346
	7	475
	8	576
Gryllus assimilis F.-----	4	187
	7	449
	8	575
	9	625
Gryllus domesticus L.-----	4	224
	7	511
	8	575
Gymnosoma fuliginosa Desv.-----	2	60
Hadrobregmus carinatus Sav-----	4	223
Hadrotettix trifasciatus Say-----	6 (Sup.)	394, 398, 401, 409
		413, 417, 419, 423, 429
		433, 439
Haemaphysalis leporis-palustris Pack.-----	5	243
	8	574
Haematobia irritans L.-----	1	27-28
	2	81
	3	136-137
	4	219
	5	308
	6	380
	7	509
	8	572
	9	623

Haematopinus eurysternus Nitz.-----	1	29
	5	309
	9	623
Haematopinus suis (L.)-----	2	83
(Changed to Haematopinus adventicius Neum.)		
Halisidota argentata Pack.-----	3	127
Halisidota caryae (Harr.)-----	3	558
Halisidota harrisi Walsh-----	3	565
Halisidota sp.-----	3	565
Halisidota tessellaris (A. & S.)-----	3	558
Halticinae-----	4	148, 183
Halticus bracteatus Say-----	3	568
Halticus citri (Ashm.)-----	1	18
	3	121
	4	195, 200
	7	502
	8	566
Hamadryas antiopa (L.)-----	2	55, 56
	3	93
	5	302
	6	367
Harnolita grandis (Riley)-----	4	162
Harnolita tritici (Fitch)-----	4	162
	5	255
	8	528
Heliothis obsoleta (F.)-----	2	51, 60, 73
	3	88, 98-99, 124
	3 (Sup.)	144
	4	148, 163, 188
	5	241, 255-256, 278
	6	314, 328-329, 359-360
	7	445, 447, 455-456, 488-489
	8	519, 522, 528-529, 544
		555-556
	9	579, 587-588, 598-599
		606-607
	10	654, 671-672
Heliothis virescens (F.)-----	2	73
	3	121
	3 (Sup.)	144
	4	199
	5	286
	5	291
Heliothrips fasciatus Perg.-----		
(Changed to Herclothrips fasciatus (Perg.))		
Heliothrips haemorrhoidalis (Bouche)-----	6	374
Hellula undalis (F.)-----	9	602
Hemerocampa leucostigma (A. & S.)-----	6	364
Hemerocampa oslari Barnes-----	9	611
Hemerocampa pseudotsugata McD.-----	9	580, 611
	10	677
Hemerocampa vetusta (Bdv.)-----	5	304
Hemichroa washingtonia Rohw. & Midd.-----	6	365

Hemileuca maia (Drury)-----	4	210
Hemileuca nevadensis Stretch-----	5	301
	6	371
Hermetia illucens L.-----	8	545
Hesperotettix speciosus (Scudd.)-----	6 (Sup.)	394, 401, 403, 423 426, 429, 433, 434
Hesperotettix viridis (Thos.)-----	6 (Sup.)	394, 398, 401, 407 409, 413, 417, 419 423, 427, 429, 435 439
Hesperotettix viridis pratensis Scudd.-----	6 (Sup.)	423
Heteroderes laurentii (Guer.)-----	3	94
Heterocampa manteo Dbldy.-----	8	558, 559
	9	580, 609
Heterospilus sp.-----	4	224
Hexarthrum ulkei Horn-----	3	139
	7	513
Hippelates dorsatus Loew-----	8	571
Hippelates spp.-----	2	79
	3	135
	6	378
	7	507
	8	571
Hippiscus corallipes (Hald.)-----	4	151
Hippiscus rugosus (Scudd.)-----	3	90
	6 (Sup.)	392, 393, 394, 398 401, 413, 423, 429
Hippodamia convergens Guen.-----	5	298
	8	549
Holotrichia mindanaona Brenske-----	9	589
Homalopalpia dalera Dyar-----	1	15
Honolella sabalella Chamb.-----	6	376
Hoplopsyllus affinis Baker-----	4	217
Horistonotus uhlerii Horn-----	6	320
Hylastinus obscurus (Marshall)-----	4	167
	5	260
Hylemya antiqua (Meig.)-----	5	284
Hylemya brassicae (Bouche)-----	3	117
	4	191-192
Hylemya cilicrura (Rond.)-----	1	17
	3 (Sup.)	146
	4	185, 192
	5	274
	10	680
Hylobius pales (Hbst.)-----	3	128
Hylobius radicis Buchanan-----	1	22-23
	4	211
Hylotrupes bajalus L.-----	6	383
	9	626
Hypera meles F.-----	7	479
Hypera postica (Gyll.)-----	1	1, 11
	1 (Sup.)	33-50
	2	60-61
	3	99-100

Hypera postica (Gyll.) (Cont'd.)-----	4	166
	5	259
	6	314, 331-332
	8	532
	9 (Sup.)	639-642
	10	661-662
Hypera punctata (F.)-----	2	61-62
	3	101-102
	4	166
Hypermallus villosus (F.)-----	6	369
	7	498
	8	559
Hyphantria cunea (Drury)-----	2	75
	3	126
	5	273, 294
	6	342, 364
	7	447, 492
	8	520, 558
	9	609
Hyphantria spp.-----	7	492
Hyphantria textor Harr.-----	5	293-294
	6	364
Hypochlora alba (Dodge)-----	6 (Sup.)	394, 401, 409, 413, 419
		429, 439
Hypoderma bovis (Deg.)-----	2	81
Hypoderma lineatum (DeVill.)-----	9	623
Hypoderma spp.-----	1	28
	2	52, 81
Hypsopygia constalis (F.)-----	7	461
	9	588
Hysteroneura setariae (Thos.)-----	2	66
	6	339
Icerya purchasi Mask.-----	1	24
	2	76
	6	374
	8	566
	9	617
Ichthyura inclusa Hbn.-----	6	371
	7	501
Idechthis canescens Grav.-----	6	382
Illinoia pisi (Kltb.)-----	1	11
(Changed to Macrosiphum pisi (Kltb.)	2	51, 61
	3	88, 100-101
	4	148, 164-165, 193
	5	242, 281
	6	350
	7	460
	8	532
	9	580, 601
	10	668

<i>Illinoia solanifolii</i> (Ashm.)-----	3	119,132
(Changed to <i>Macrosiphum solanifolii</i> (Ashm.))	4	216
	6	343, 353
	8	547
<i>Inareolata punctoria</i> Roman-----	9 (Sup.)	629, 631-635, 637 650-651, 653-656
<i>Ips calligraphus</i> Germ.-----	9	613
<i>Iridomyrmex humilis</i> Mayr-----	6	342, 382
	9	625
<i>Iridomyrmex pruinosus analis</i> Andre-----	6	382
<i>Isoptera</i> -----	6	331
	9	625
<i>Itame ribearia</i> (Fitch)-----	5	271
<i>Ithycerus noveboracensis</i> (Forst.)-----	4	175
	5	265
<i>Ixodes ricinus scapularis</i> Say-----	2	83
	9	624
<i>Kermes pubescens</i> Bogue-----	5	299
	7	499
<i>Labops hirtus</i> Knight-----	4	162
<i>Labrorychus prismaticus</i> Nort.-----	9 (Sup.)	650, 651, 654
<i>Lachnus</i> sp.-----	9	615
<i>Lachnus thujaefilina</i> Del G.-----	1	25
	2	77
	3	131
	4	214
<i>Laetilia coccidivora</i> Comst.-----	3	130
	9	614
<i>Lampra alternata</i> Grote-----	5	246
<i>Languria mozzardi</i> Latr.-----	4	167
<i>Laphygma exigua</i> (Hbn.)-----	2	74
	5	290
<i>Laphygma frugiperda</i> (A. & S.)-----	2	74
	5	248
	6	329
	7	445, 456-457
	8	519, 529-530
	9	579, 582
	10	665
<i>Lasioderma serricorne</i> (F.)-----	9	627
<i>Lasioptera vitis</i> O. S.-----	5	271
<i>Lasius interjectus</i> Mayr-----	1	30
	4	223
<i>Lasius niger neoniger</i> Emery-----	4	223
<i>Laspeyresia caryana</i> (Fitch)-----	3	111
	4	181
	9	595
<i>Laspeyresia coniferana</i> Ratz.-----	10	684
<i>Laspeyresia nigricana</i> (Steph.)-----	7	479
<i>Latrodectus mactans</i> (F.)-----	8	571
	9	621

Lecaniodiaspis sp.-----	1	22
Lecanium corni Bouche-----	5	261
Lecanium coryli L.-----	4	179
Lecanium nigrofasciatum Perg.-----	1	14, 23
	5	298
	6	368
Lecanium persicae (F.)-----	3	127
Lecanium quercifex Fitch-----	3	128
Leis dimidiatus F.-----	2	52, 67
Lema sexpunctata Oliv.-----	8	542
Leperisinus aculeatus Say-----	7	513
Lepidosaphes beckii (Newm.)-----	6	343
	7	471
	8	540
	9	596
Lepidosaphes camelliae Hoke-----	1	25
Lepidosaphes ficus (Sign.)-----	3	112
Lepidosaphes ulmi (L.)-----	2	76
	3	130-131
	4	213
	5	303
	7	502
Leptinotarsa decemlineata (Say)-----	1	17
	2	70
	3	88, 115
	4	148, 187-188
	5	277
	6	315, 316, 346-347
	7	475
	8	543
Leptinotarsa juncta (Germ.)-----	8	543
Leptocoris trivittatus (Say)-----	1	30-31
	2	85
	7	495
	9	626
Leptoglossus phyllopus (L.)-----	9	590
Leucocnemis sp.-----	3	93
Lichenomima lugens Hagen-----	9	626
Ligyris gibbosus (Deg.)-----	4	184-185
	5	306
	6	345
Limenius agonus Say-----	3	94
	3 (Sup.)	145
	4	155
	9	583
Limenius californicus (Mann.)-----	1	1, 9
	2	72
	3	94
	4	156
	6	321
	8	526
Limenius canus Lec.-----	3	94
Limenius dubitans Lec.-----	9	583
Limenius infuscatus Mots.-----	3	94

Linognathus piliferus Burm.-----	1	29
Linognathus spp.-----	2	83
	4	221
Linognathus vituli L.-----	1	28-29
	2	82
Liometopus occidentalis Emery-----	4	223
Liponyssus bacoti (Hirst)-----	1	27
	2	79-80
	3	136
	4	218
	7	507
Liponyssus bursa Berlese-----	5	307
Liponyssus sylviarum C. & F.-----	6	379
Listroderes apicalis Wtrh.-----	4	182
Listroderes obliquus Klug-----	1	2,15-16,20
	2	52,69
	3	83,113
	3 (Sup.)	145
	4	182
	10	667-668
Listronotus latiusculus (Boh.)-----	1	19
	4	196
Lithocolletes blanchardella F.-----	7	464
Lithocolletes conglomeratella Zell.-----	7	498
Lithocolletes hamadryella Clem.-----	6	369
Lixus concavus Say-----	5	286
Longistigma caryae (Harr.)-----	7	469
	8	540,559-560
Loxostege similalis (Guen.)-----	7	450
	9	580,597
Loxostege spp.-----	7	450
	9	580
Loxostege sticticalis (L.)-----	4	155
	5	247
	6	314,316,323
	7	450
	8	532
	9	582
Lucilia sericata Meig.-----	4	221
Lucilia spp.-----	2	82
	6	380
	9	622
Ludius aereipennis (Kby.)-----	5	248
Ludius aereipennis destructor Brown-----	6	321
Lycophotia margaritosa saucia Hbn.-----	3	87,91,96
(Changed to Peridroma margaritosa (Haw.))		
	3 (Sup.)	145
	4	151,152,153,159
	5	246
	7	449-450
	4	224
	9	588
	9 (Sup.)	635,649-656
Lyctus planicollis Lec.-----		
Lydella stabulans Meig.-----		
Lydella stabulans griseocens R. D.-----		

Lygaeonematus erichsonii (Htg.)-----	7	496
	8	521, 561
Lygus elisus hesperius Knight-----	2	61
	7	460
Lygus elisus Van. D.-----	7	460
Lygus pratensis L.-----	2	63
(Changed to Lygus pratensis oblineatus (Say))	3	103
	3 (Sup.)	146
	4	203
	6	355, 361
	7	446, 474
	8	523, 538, 570
Lygus spp.-----	4	203
Macremphytus tarsatus Say-----	7	503
Macremphytus varianus Nort.-----	7	503
Macrobasis immaculata Say-----	6	345
	7	473
Macrobasis segmentata Say-----	5	276
	6	345
	7	473
Macrobasis toras Lec.-----	5	276
Macrobasis unicolor (Kby.)-----	5	275
	6	345
Macrocentrus gifuensis Ashm.-----	9 (Sup.)	629, 631-634, 636, 637
		651, 653, 655, 656
Macroductylus subspinosus (F.)-----	4	158
	5	250
Macronoctua onusta Grote-----	7	504
Macrosiphoniella sanborni (Gill.)-----	2	77
	3	131
	8	567
	9	617
Macrosiphum rosae (L.)-----	2	78
	3	133
	8	570
Macrosiphum rubiellum harpagorubus Knlt.-----	4	179
Macrosiphum spp.-----	9	594
Magdalis armicollis (Say)-----	5	296
Magdalis septendecim (L.)-----	10	672-673
Malacosoma americana (F.)-----	1	12-13
	2	64
	3	88, 105-106
	4	172
	5	243, 263
Malacosoma californica (Pack.)-----	10	665-666
	2	76
	3	103
Malacosoma disstria Hbn.-----	1	21
	3	89, 103, 125-126
	4	206-207
	5	243, 292-293

Malacosoma disstria Hbn. (Cont'd.)-----	6	315, 363
	7	447, 493
	8	559
	9	609
	10	676
Malacosoma pluvialis (Dyar)-----	4	207
	6	363
Malacosoma sp.-----	5	293
	8	559
Mamestra picta Harr.-----	4	186
(Changed to Ceramica picta Harr.)		
Margarodes sp.-----	3	131
Matsucoccus matsuurae Kuw.-----	6	370
Matsucoccus sp.-----	3	129
	10	680
Megamelus davisii Van D.-----	6	377
Megamelus proserpina Kirk.-----	6	384
Melanocallis calycifoliae (Davis)-----	6	342
	7	469
	8	540
	9	596
Melanoplus alpinus Scudd.-----	6 (Sup.)	439
Melanoplus angustipennis (Dodge)-----	6 (Sup.)	394, 396, 401, 405, 407
		409, 411, 412, 413, 415
		419, 423, 426, 429, 439
		442, 443
Melanoplus angustipennis impiger Scudd.-----	6 (Sup.)	426, 427
Melanoplus arizonae Scudd.-----	6 (Sup.)	394, 423, 433
Melanoplus bispinosus Scudd.-----	6 (Sup.)	401, 426
Melanoplus bivittatus (Say)-----	4	149, 150
	5	244, 245
	6	316, 319
	6 (Sup.)	386-387, 389, 443
	7	448, 449
	9	582
Melanoplus borealis (Fieber)-----	6 (Sup.)	439
Melanoplus bowditchi Scudd.-----	6 (Sup.)	394, 396, 410, 419, 439
Melanoplus bowditchi bowditchi Scudd.-----	6 (Sup.)	423, 426
Melanoplus bruneri Scudd.-----	6 (Sup.)	407, 419, 439
Melanoplus confusus Scudd.-----	4	150
	5	244
	6 (Sup.)	334, 398, 401, 407, 410,
		413, 419, 423, 427, 429
		431, 439
Melanoplus dawsoni Scudd.-----	6 (Sup.)	405, 407, 408, 410, 419
		429, 431, 435, 437, 438
		439
Melanoplus devastator Scudd.-----	6	320
Melanoplus differentialis (Thos.)-----	1	8
	2	53
	4	149, 150
	5	245
	6	318, 319

Melanoplus differentialis (Thos.) (Cont'd.)----	6 (Sup.)	386-404, 410-435, 439
		443
	7	448, 449
	8	519, 524
	9	581, 582
Melanoplus dodgei (Thos.)-----	6 (Sup.)	430
Melanoplus fasciatus (Walk.)-----	6 (Sup.)	430
Melanoplus femur-rubrum (Deg.)-----	3	90
	4	149
	5	245
	6	320
	6 (Sup.)	386-424, 430-443
	7	448
	8	524
	9	581
Melanoplus flavidus Scudd.-----	6 (Sup.)	401, 424, 427, 430, 433
		440
Melanoplus flavidus flavidus Scudd.-----	6 (Sup.)	395, 413, 415, 417, 419
Melanoplus fluviatilis Brun.-----	6 (Sup.)	433, 440
Melanoplus foedus Scudd.-----	6 (Sup.)	395, 396, 397
Melanoplus foedus fluviatilis Brun.-----	6 (Sup.)	401, 410, 413, 424, 426
		430, 431
Melanoplus foedus foedus Scudd.-----	6 (Sup.)	401, 413, 415, 417, 418
		424, 430, 440, 443
Melanoplus foedus iselyi Hebard-----	6 (Sup.)	424, 426, 427
Melanoplus gladstoni Scudd.-----	6 (Sup.)	390, 391, 395, 398, 407
		410, 414, 417-419, 430
		440
Melanoplus glaucipes (Scudd.)-----	6 (Sup.)	424, 426
Melanoplus impiger Scudd.-----	6 (Sup.)	401, 426, 427, 433
Melanoplus infantilis Scudd.-----	6 (Sup.)	395, 401, 405, 407, 410
		420, 421, 430, 435, 440
Melanoplus keeleri luridus (Dodge)-----	6 (Sup.)	395, 398, 405, 407, 414
		435, 436, 440
Melanoplus kennicottii Scudd.-----	6 (Sup.)	410, 440
Melanoplus lakinus (Scudd.)-----	6 (Sup.)	390, 391, 395, 396, 402
		403, 414, 417, 418, 424
		426, 430, 431, 433, 434
	8	525
Melanoplus marginatus (Scudd.)-----	6	320
Melanoplus mexicanus (Sauss.)-----	3	90
	4	149, 150
	5	244, 245
	6	313, 318-319, 320
	6 (Sup.)	386-443
	7	448, 449
	8	519, 524-525
	9	581
	10	658
Melanoplus occidentalis (Thos.)-----	6 (Sup.)	390, 391, 395, 398, 399
		402, 403, 410, 414, 417
		418, 420, 424, 430, 431
		433, 434, 440

Melanoplus oklahomae Hebard-----	6 (Sup.)	424
Melanoplus oregonensis (Thos.)-----	6 (Sup.)	440
Melanoplus packardii Scudd.-----	5	245
	6	319
	6 (Sup.)	390, 391, 395, 398, 402
		403, 407, 414, 417, 427
		430, 436, 440, 443
	7	449
Melanoplus ponderosus ponderosus (Scudd.)-----	6 (Sup.)	424
Melanoplus ponderosus viola (Thos.)-----	6 (Sup.)	424
Melanoplus regalis (Dodge)-----	6 (Sup.)	395, 402, 414, 424, 433
		434
Melanoplus scudderi scudderi (Uhl.)-----	6 (Sup.)	424
Melanoplus spp.-----	5	244
	6 (Sup.)	390, 414, 440
	8	525
Melanoplus texanus (Scudd.)-----	6 (Sup.)	424
Melanoplus yarrowii (Thos.)-----	6 (Sup.)	390
Melanotus oregonensis (Lec.)-----	3	94
Melanotus sp.-----	5	248
Melanoxantherium smithiae Monell-----	7	501
	8	565
Melittia satyriniformis Hbn.-----	4	193
	6	352
	7	432
	8	548
	9	603
Meloidae-----	5	275-276
	6	315, 344, 345
	7	473
Melophagus ovinus (L.)-----	1	29
	4	221
Meogastrallus librinocens Fisher-----	4	224
Mermiria bivittata (Serv.)-----	6 (Sup.)	424
Mermiria maculipennis Brun.-----	6 (Sup.)	395, 402, 410, 414, 415
		420, 424, 430, 431, 433
		435, 436, 440
Mermiria maculipennis macclungi Rehn-----	6 (Sup.)	414, 440
Mermiria neomexicana (Thos.)-----	6 (Sup.)	395, 402, 417
Mermiria sp.-----	6 (Sup.)	390, 391, 417, 433
Meromyza americana Fitch-----	5	254
	7	455
Mestobregma plattei Thos.-----	6 (Sup.)	398
Metator pardalinus Sauss.-----	6 (Sup.)	395, 402, 407, 410, 411
		414, 415, 418, 420, 421
		422, 424, 430, 440, 442
Meteorus nigricolis Thoms.-----	9 (Sup.)	636
Metriona bicolor (F.)-----	5	284
Metriona bivittata Say-----	5	284
Microbracon brevicornis Wesm.-----	9 (Sup.)	629, 630, 632-637
Microbracon mellitor Say-----	3	551
Microbregma emarginatum Duft.-----	6	383
Microgaster tibialis Nees.-----	9 (Sup.)	636

Microplectron fuscipennis Zett.-----	10	678
Mineola indigenella (Zell.)-----	3	103
Miridae-----	5	253
	6	332
Miris dolobratus (L.)-----	4	161, 167
	5	253
Mocis repanda F.-----	3	534
Mollusca-----	5	259
Monarthropalpus buxi Laboulb.-----	3	131
	4	214
Monellia costalis Fitch-----	7	469
Monochamus notatus Drury-----	6	383
Monochamus scutellatus Say-----	6	383
Monochamus titillator F.-----	6	383
	3	563
Monocrepidius vespertinus F.-----	6	321
Monomorium pharaonis (L.)-----	6	382
	7	510
	9	625
Mononychus vulpeculus F.-----	5	304
Monophadnoides rubi (Harr.)-----	4	179
	5	270
Monopis croci-capitella Clem.-----	1	31
Monotoma parallela Lec.-----	9	627
	10	683
Monotoma quadrifoveolata Aube-----	9	627
Mordwilkoja vagabunda (Walsh)-----	3	129
Murgantia histrionica (Hahn)-----	2	52, 71
	3	88, 117-118
	4	192
	5	282
	6	315, 351-352
	7	481
	8	547-548
	9	603
Muscina pabulorum (Fall.)-----	10	685
Mycophila fungicola Felt-----	9	605
Myzocallis californicus Baker-----	5	293-299
Myzocallis kahawaluokalani Kirk.-----	7	503
	9	617
Myzus cerasi (F.)-----	4	178
	5	269
Myzus essigi G. & P.-----	6	568
Myzus ornatus Laing-----	3	89, 130
Myzus persicae (Sulz.)-----	1	19
	2	71
	3	119
	4	186
	5	276
	6	346, 353
	7	477
	9	604
Myzus sp.-----	9	619

Naupactus leucoloma Boh.-----	4	158
	6	314, 344
	10	663-664
Naupactus sp.-----	4	158
	10	664
Nemobius fasciatus Deg.-----	8	576
Nemorilla floralis Fall.-----	9 (Sup.)	636
Neoborus amoenus Reut.-----	4	208
Neoclytus acuminatus (F.)-----	9	612
Neoclytus caprea Say-----	6	365
Neodiprion abbotti Leach-----	6	370
	8	563
Neodiprion abietis (Harr.)-----	5	300
Neodiprion banksianae Rohw.-----	3	128
Neodiprion lecontei (Fitch)-----	9	614
Neodiprion pinetum Nort.-----	5	300
	6	370
	9	613
Neodiprion sertifer Geoff.-----	5	300
	6	370
	10	678
Neodiprion sp.-----	3	128
	5	299-300
	6	370
	8	563
	9	613
	10	678-679
Neolecanium cornuparvum (Thro)-----	6	376
Neopodismopsis abdominalis Thos.-----	6 (Sup.)	420, 440
Neoprociphilus aceris Monell-----	5	298
	7	498
Nephelodes emmedonia (Cram.)-----	4	152, 153
Nephrotoma sodalis Loew-----	3 (Sup.)	146
Nopytia canosaria Walk.-----	10	677
Neuroterus saltatorius Edwards-----	8	562
Neuroterus umbilicatus Bass.-----	6	369
Neurotoma inconspicua Nort.-----	5	270
Nezara viridula (L.)-----	5	276
	8	542, 557
Noctuidae-----	1	8-9
	2	55
	3	87, 91-93
	3 (Sup.)	145
	4	147, 151-155
	5	241, 242-243, 246-247
	7	449-450
	4	213
Nodonota puncticollis (Say)-----	5	305-306
	7	512, 513
Nomophila sp.-----	4	167
Nygma phaeorrhoea (Donov.)-----	10	675-676
Nysius ericae (Schill.)-----	1	19
	4	158
	6	346

Nysius ericae (Schill.) (Cont'd.)-----	8	542
	9	598
Oberca bimaculata (Oliv.)-----	6	340
	8	539
Ochrosidia borealis Arrow-----	4	158
	6	322
	9	616
Ochrosidia immaculata Oliv.-----	9	584
Ochrosidia spp.-----	9	584
Ochrosidia villosa (Burm.) <u>See</u> Ochrosidia borealis Arrow.		
Oecanthus nigricornis quadripunctatus Beut.---	5	306
Oecanthus niveus (Deg.)-----	3	110
Oedionychis gibbitarsa Say-----	4	183
Oestris ovis L.-----	2	83
	4	221
	7	510
	8	574
	9	624
Olene achatina (A. & S.)-----	8	562
Omphalocera dentosa Grote-----	6	374
Oncideres cingulatus (Say)-----	6	369
	9	595
Oncometopia undata F.-----	5	306
	9	610
Opeia obscura Thos.-----	6 (Sup.)	390, 391, 395, 402, 404 407, 410, 414, 420, 430 433, 440
Opeia testacea Scudd.-----	6 (Sup.)	390
Opius humilis Silv.-----	6	384
Orchestes pallicornis Say-----	5	265
(Changed to Rhynchaenus pallicornis (Say))		
Orchestes rufipes Lec.-----	6	373
Ornithodoros magnini Duges-----	9	623
Ornix geminatella Pack.-----	7	464
Orphulella compta Scudd.-----	6 (Sup.)	390, 391
Orphulella deserteta Scudd.-----	6 (Sup.)	435
Orphulella pelidna (Burm.)-----	6 (Sup.)	392, 393, 395, 398, 399 402, 404, 407, 410, 414 420, 424, 430, 440
Orphulella speciosa (Scudd.)-----	6 (Sup.)	398, 399, 402, 403, 405 407, 414, 420, 424, 430 440
Oryzaeophilus surinamensis (L.)-----	1	31
	7	513
	9	627
Oxyptilus periscelidactylus (Fitch)-----	5	271
(Changed to Pterophorus periscelidactylus Fitch)		
Pachylobius picivorus Germ.-----	3	128
Pachynematus extensicornis Nort.-----	5	260

Pachnaeus opalus Oliv.-----	5	281
	7	466
	10	683
Pachnaeus sp.-----	3	112
Pachypsylla celtidis-mamma Riley-----	1	21
	9	612
Paleacrita vernata (Peck)-----	2	52, 74-75
	4	205-206
	5	292
Palmodus laevis Cress.-----	6	325
	10	661
Pantomorus godmani Crotch-----	6	322
	7	452, 453
	8	519, 527
	9	584
Panzeria penitalis Coq.-----	9 (Sup.)	650, 654
Papaipema nebris nitela Guen.-----	4	189
	5	242, 257
	6	314, 322-323
	8	567
Papaipema purpurifascia (G. & R.)-----	6	375
Papilio cresphontes Cram.-----	3	93
	9	596
Papilio glaucus turnus (L.)-----	2	56
Papilio thoas L.-----	7	471
	9	596
Paragrotis scandens Riley-----	4	153
Parastichtis bicolorago Guen.-----	3	92
	3 (Sup.)	145
	4	153
Paratetranychus alpinus McG.-----	8	566
Paratetranychus citri McG.-----	1	15
	2	68
Paratetranychus pilosus (C. & F.)-----	1	14
	2	65
	4	169-170
	5	266
	6	336-337
	7	446, 465
	8	523
	9	591
Paratetranychus uniunguis Jacobi-----	5	302
	6	371-372
	7	500
Paratetranychus yothersi McG.-----	6	366
Paratrioza cockerelli Sulc.-----	3	116
	4	189
	5	279
	6	315, 348
	7	446, 476
	8	523
Paratylotropidia brunneri Scudd.-----	6 (Sup.)	424
Pardalophora apiculata (Harr.)-----	6 (Sup.)	424

<i>Pardalophora haldemanii</i> (Scudd.)-----	2		54
	6 (Sup.)	395, 425, 430,	440
<i>Pardalophora phoenicoptera</i> (Burm.)-----	6 (Sup.)		425
<i>Pardalophora saussurei</i> Scudd.-----	6 (Sup.)		425
<i>Pardalophora</i> sp.-----	6 (Sup.)		402
<i>Parharmonia pini</i> Kellicott-----	1		22
<i>Parlatoria olea</i> Colv.-----	9		619
<i>Parlatoria pergandii camelliae</i> Comst.-----	1		25
<i>Parlatoria zizyphi</i> Sign.-----	1		32
<i>Paropomala wyomingensis</i> Thos.-----	6 (Sup.)	395, 414,	417
<i>Paropomala wyomingensis wyomingensis</i> Thos.-----	6 (Sup.)		425
<i>Pseudococcus</i> spp.-----	1		24
<i>Paurocephala ilecis</i> Ashm.-----	1		25-26
<i>Pectinophora gossypiella</i> (Saund.)-----	2		73
	3		125
	4		202
	5		289
	6		357-358
	7		447, 489
	8		556
<i>Pegomya hyoscyami</i> (Panz.)-----	3		119
	5		284
<i>Pegomya rubivora</i> (Coq.)-----	6		340
<i>Pelecotoma flavipes</i> Melsh.-----	4		223
<i>Pelidnota punctata</i> L.-----	7		468
<i>Pemphigus rhois</i> Fitch-----	7		501
<i>Penthaleus major</i> Duges-----	7		447, 480
	10		684
<i>Peregrinus maidis</i> Ashm.-----	7		460
	8		531
	9		579, 589
<i>Periclista hicoriae</i> Rohw.-----	3		111
<i>Periclista</i> sp.-----	3		111
<i>Perillus bioculatus</i> F.-----	5		283
<i>Periphyllus lyropictus</i> (Kess.)-----	4		210
	5		297
	7		498
	8		561
<i>Periphyllus populicola</i> Thos.-----	8		564
<i>Periplaneta americana</i> (L.)-----	5		311
<i>Petrova comstockiana</i> (Fern.)-----	4		211-212
<i>Phaeogenes nigridans</i> Wesm.-----	9 (Sup.)	629, 631-634,	636, 637
			654, 656
<i>Phenacoccus acericola</i> King-----	4		210
<i>Phenacoccus dearnessi</i> King-----	4		209
<i>Philaenus leucophthalmus</i> L.-----	3		120
	4		186
<i>Philonix pezomachoides</i> O. S.-----	9		612
<i>Philosamia cynthia</i> Drury-----	3		93
<i>Phlibostroma quadrimaculatum</i> Thos.-----	6 (Sup.)	395, 396, 402, 403,	410
		411, 414, 415, 417,	420
		421, 425, 426, 427,	430
		433, 434, 441,	442
<i>Phloeosinus cristatus</i> Lec.-----	7		505

Phoetaliotes nebrascensis (Thos.)-----	6 (Sup.)	395, 398, 399, 402, 407 410, 414, 420, 430, 435 436, 441
Phormia regina Meig.-----	1	29
Phorocera erecta Coq.-----	9 (Sup.)	636
Phorodon humili (Schr.)-----	5	284
Phyllaphis fagi L.-----	5	294-295
Phyllobius oblongus L.-----	5	265
Phyllocnistus liriiodendrella Clem.-----	8	565
Phyllocoptes oleivorus Ashm.-----	1	2, 15
	2	68
	3	112
	4	182
	6	343
	7	472
	8	540
	9	596
Phyllocoptes quadripes Shim.-----	4	210
	5	293
	6	369
Phyllocoptes schlechtendali Nal.-----	6	334
Phyllophaga anxia (Lec.)-----	4	157
	4 (Sup.)	228, 230, 233, 236, 238
Phyllophaga balia (Sav)-----	4 (Sup.)	228, 233, 236, 238
Phyllophaga congrua Lec.-----	3	95
Phyllophaga crenulata (Froel.)-----	4	156
	4 (Sup.)	228, 233, 236, 238
	5	248
Phyllophaga crinita Burm.-----	3	95
Phyllophaga drakei (Kby.)-----	4 (Sup.)	228, 230, 233, 236, 238
Phyllophaga fervida F.-----	3	95
Phyllophaga forsteri Burm.-----	3	94
Phyllophaga fusca (Froel.)-----	4	157
	4 (Sup.)	227, 228, 230, 232, 233- 238, 240
Phyllophaga futilis Lec.-----	4 (Sup.)	228, 232, 233, 234, 236 238, 240
Phyllophaga glabricula Lec.-----	5	249
Phyllophaga gracilis Burm.-----	5	248
Phyllophaga hirticula Knoch-----	3	94
	4	156
	4 (Sup.)	226-228, 230, 232, 233 234-236, 240
	9	583
Phyllophaga ilicis (Knoch)-----	4 (Sup.)	228, 232, 233, 235-238 240
Phyllophaga implicita (Horn)-----	4 (Sup.)	227, 228, 230, 232-238 240
Phyllophaga inversa (Horn)-----	4 (Sup.)	233, 238
Phyllophaga lanceolata Say-----	1	9
	2	59
	3	97
	4	157
	5	249

Phyllophaga marginalis (Lec.)-----	4 (Sup.)	228, 233, 236, 238
Phyllophaga micans Knoch-----	3	95
	4	156
Phyllophaga nitida (Lec.)-----	4 (Sup.)	228, 230, 233, 236, 238
Phyllophaga praetermissa Horn-----	4	156
Phyllophaga prunina (Lec.)-----	4 (Sup.)	228, 232, 236, 238
Phyllophaga prununculina Burm.-----	5	248
Phyllophaga rugosa (Melsh.)-----	4 (Sup.)	227, 228-230, 232-238
		240
	5	248
Phyllophaga spp.-----	1	1, 9
	2	51, 54-55
	3	87, 94-95
	4	156-157
	4 (Sup.)	225-240
	5	243, 248-249
	6	354
	7	445, 450-451
	8	522
	9	583-584, 621
	10	679
Phyllophaga spreta (Horn)-----	4 (Sup.)	228, 230, 232, 235, 236
		238
Phyllophaga tristis F.-----	4	156, 157
	4 (Sup.)	226-228, 230-238, 240
Phyllophaga uniformis Blanch.-----	5	248
Phyllotreta pusilla Horn-----	5	276
Phyllotreta vittata F.-----	4	183
Phylloxera devastatrix Perg.-----	4	181
Phylloxera sp.-----	3	111
	6	341
Phylloxera vitifoliae (Fitch)-----	8	539
Physokermes insignicola Crawf.-----	7	500
Physokermes piceae Schr.-----	7	500
Physostegania pustularia Guen.-----	5	292
Phytodecta pallida L.-----	5	301
Phytomyza aquilegiae Hardy. <u>See</u> P. minuscula Gour.		
Phytomyza atricornis Meig.-----	10	683
Phytomyza chrysanthemi (Kowarz)-----	8	567
Phytomyza ilicis Curt.-----	2	77-78
	3	132
	4	215
Phytomyza minuscula Gour.-----	8	567-568
Phytophaga destructor (Say)-----	2	51, 58-59
	3	87, 97
	4	147, 162
	5	241, 253-254
	6	327-328
	7	446, 455
	7 (Sup.)	515-517
	8	519, 527-528
	9	585-586
	10	659-660

<i>Pieris monuste</i> (L.)-----	4	191
<i>Pieris rapae</i> (L.)-----	2	70
	3	117
	4	191
	5	282
	6	316, 351
	7	480
	8	547
	9	601-602
<i>Pikonema alaskensis</i> Rohw.-----	6	371
<i>Pikonema dimmockii</i> Cress.-----	9	615
<i>Pinnaspis buxi</i> Bouche-----	6	384
<i>Pineus strobi</i> (Htg.)-----	3	129
	5	301
	7	500
	8	563
<i>Pinipestes zimmermanni</i> Grote-----	6	370
<i>Pissodes nemorensis</i> Germ.-----	1	26
	3	131
	9	613
<i>Pissodes strobi</i> (Peck)-----	2	75
	7	499
	8	563
<i>Pityophthorus</i> sp.-----	7	499
<i>Plagiodera versicolora</i> Laich.-----	7	501
<i>Plathypena scabra</i> (F.)-----	1	11
	3	102
	8	533
	9	601
<i>Platycampus laricis</i> Roh. & Midd.-----	9	612
	10	677
<i>Platycampus larivicornis</i> Rohw. & Midd.-----	7	496
	9	612
	10	677
<i>Platypus flavicornis</i> (F.)-----	9	613
<i>Platysamia cecropia</i> (L.)-----	3	93
(Changed to <i>Samia cecropia</i> (L.))		
<i>Plectrodera scalator</i> F.-----	7	493
<i>Plodia interpunctella</i> (Hbn.)-----	7	500
	3	139
	6	382
<i>Plutella maculipennis</i> (Curt.)-----	1	18
	5	282
<i>Podosesia syringae</i> (Harr.)-----	5	305
	8	569
<i>Poecilocapsus lineatus</i> (F.)-----	5	303
<i>Pogonomyrmex barbatus</i> (F. Smith)-----	4	223
	6	382
<i>Pogonomyrmex occidentalis</i> Cress.-----	7	510
<i>Polia renigera</i> (Steph.)-----	5	247
<i>Polistes canadensis annularis</i> L.-----	3 (Sup.)	144
<i>Polistes fuscatus rubiginosus</i> Lep.-----	3 (Sup.)	144
<i>Polistes fuscatus variatus</i> Cress.-----	7	510-511
<i>Pollenia rudis</i> (F.)-----	1	32
	2	85

Polycaon confertus Lec.-----	5	305
Polychrosis viteana (Clem.)-----	6	341
	7	468
	9	579, 594
Popillia japonica Newm.-----	3	95
	4	157
	5	249-250
	6	313, 321-322
	7	445, 451-452
	8	519, 526
	10	680-681
Porcellio laevis Latr.-----	7	513
Porcellionidea pruinosa Brdt.-----	7	513
Porosagrotis orthogonia Morr.-----	1	1, 9
(Changed to Agrotis orthogonia Morr.)		
	3	93
	4	153
	5	242, 247
Porthetria dispar (L.)-----	4	207
	6	364
	7	447, 493
	9	609
	10	675
Priomerus calceatus Say-----	3	132
Prionidae-----	9	612
Prionoxystus robiniae (Peck)-----	1	21
	2	76
	5	294
	7	494
Prionus laticollis (Drury)-----	9	613
Prionus sp.-----	8	552
Prociphilus erigeronensis Thomas-----	8	566
Prociphilus fraxinifolii Riley-----	6	365
Prociphilus tessellatus (Fitch)-----	4	210
	5	297
	6	368
Prodenia eridania (Cram.)-----	6	355
Prodenia ornithogalli Guen.-----	4	153
	5	246, 247
Prodesmotopa latipes Meig.-----	9	626
Profenusa collaris MacG.-----	4	178
	5	270
Prosimulium hirtipes Fries-----	3	134
	4	217
Protoparce quinquemaculata (Haw.)-----	3 (Sup.)	143-144
	5	286
	6	354
	7	477
	8	523, 550
	9	605
Protoparce sexta (Johan.)-----	3	89, 121
	3 (Sup.)	143-144
	5	286
	6	347
	7	477
	9	605

Protoparce spp.-----	1	20
	3 (Sup.)	143-144
	4	139, 199
	6	347, 354
	8	543, 550
	9	600
Psallus seriatus (Reut.)-----	2	73-74
	3	89, 123-124
	4	202-203
	5	290-291
	6	360-361
	7	490
	8	556-557
	9	608
	10	672
Pseudococcus adonidum (L.)-----	3	130
Pseudococcus brevipes (Ckll.)-----	2	68
Pseudococcus citri (Risso)-----	3	112
	4	181
	5	273
	6	343
	8	566
	9	616
Pseudococcus comstocki Kuw.-----	2	77
	9	592
Pseudococcus cuspidata Rau.-----	6	377
Pseudococcus maritimus (Ehrh.)-----	7	469
Pseudococcus spp.-----	1	24
	3	130
	9	616-617
Pseudopomala brachyptera (Scudd.)-----	6 (Sup.)	435, 441
Psocidae-----	6	383
	7	512
	8	577
	9	626
Psocus sp.-----	7	512
Psocus striatus Walker-----	9	626
Psoloessa delicatula Scudd.-----	6 (Sup.)	390
Psoloessa delicatula delicatula Scudd.-----	6 (Sup.)	395
Psorophora ciliata F.-----	7	506
Psorophora colombiae D. & K.-----	6	378
Psoroptes communis ovis Hering-----	4	221
Psorosina hammondi (Riley)-----	6	335
	8	536
Psylla buxi (L.)-----	5	303
Psylla pyricola (Foerst.)-----	2	66
	3	109-110
	4	178
	5	268
	6	339
	7	467
Psylliodes punctulata Melsh.-----	2	70
	4	198
Psyllopsis fraxinicola Foerst.-----	6	365
Pterocyclon fasciatum Say-----	8	577
Pteronidea ribesii (Scop.)-----	5	271

<i>Ptinus brunneus</i> Duft.-----	3	139
<i>Ptinus fur</i> L.-----	4	224
<i>Ptinus tectus</i> Boieldieu-----	2	85
<i>Ptychodes trilineatus</i> L.-----	7	472
<i>Pulvinaria vitis</i> (L.)-----	4	210
	5	298
	6	369
<i>Pycnoscelus surinamensis</i> (L.)-----	8	523
<i>Pyrausta nubilalis</i> (Hbn.)-----	1	10
	3	99
	4	163-164
	5	256-257
	6	314, 329
	7	445, 457-458
	8	519, 522, 530, 545
	9	579, 588
	9 (Sup.)	629, 637, 643-647, 649-656
	10	658-659
<i>Pyroderces rileyi</i> Wlsm.-----	9	589
<i>Recurvaria milleri</i> Busck-----	6	370
	9	614
<i>Recurvaria piceaella</i> Kearf.-----	5	301
	3	564
<i>Recurvaria</i> sp.-----	5	301
	9	614
	10	679
<i>Reticulitermes flavipes</i> Koll.-----	2	83, 84
	3	138
	6	381
<i>Reticulitermes</i> spp.-----	1	30
	2	83-84
	3	138
	4	222
	6	381
<i>Reticulitermes tibialis</i> Banks-----	1	30
	2	84
	3	138
	6	381
<i>Retinodoplosis resinicola</i> O. S.-----	5	300-301
<i>Rhabdophaga strobiloides</i> Walsh-----	3	565
<i>Rhagoletis cingulata</i> (Loew)-----	5	269
	6	317, 339
	3	538
<i>Rhagoletis fausta</i> (O. S.)-----	5	269
<i>Rhagoletis pomonella</i> (Walsh)-----	5	265
	6	336
	7	464-465
	8	520, 536-537
	9	593
<i>Rhagoletis</i> spp.-----	6	339

Rhipicephalus sanguineus (Latr.)-----	1	29-30
	4	222
	7	509-510
	9	621
Rhizoglyphus hyacinthi Bdv.-----	9	618
Rhizoglyphus phylloxera Riley-----	9	628
Rhizopertha dominica F.-----	9	628
Rhodites nebulosus Bass.-----	5	305
Rhodobaenus tredecimpunctatus (Ill.)-----	5	306
	7	503
Rhopalosiphum prunifolia (Fitch)-----	2	64, 65
	3	107
	4	173
Rhopalosiphum pseudobrassicae (Davis)-----	1	18
	2	71
	4	196
	7	483
	8	549
	9	604
Rhopalosiphum subterraneum Mason-----	4	203
Rhopobeta naevana ilicifoliana Kearf.-----	4	215
Rhyacionia buoliana (Schiff.)-----	1	22
	3	128
	4	211
	5	299
	8	562
	10	679
Rhyacionia frustrana Comst.-----	4	211
	7	499
	8	562
	9	580, 614
	10	679
Rhyacionia rigidana Fern.-----	5	299
Rhynchites bicolor (F.)-----	4	216
	5	305
	6	376
Romalea microptera (Beauv.)-----	3	90
Saissetia oleae (Bern.)-----	7	471
Saperda calcarata Say-----	1	23
Saperda candida F.-----	4	169
	6	375
	8	536
Sarcophaga kellyi Ald.-----	5	245
	7	449
Sarcophaga sp.-----	8	573
	9	622
Scapteriscus acletus R. & H.-----	3	115
	4	187
	7	475
	8	576
Scapteriscus spp.-----	1	17
	3 (Sup.)	145

Scapteriscus vicinus Scudd.-----	2	70
Schistocerca alutacea Harr.-----	6 (Sup.)	405
Schistocerca americana Drury-----	9	579, 581
Schistocerca americana americana (Drury)-----	6 (Sup.)	425
Schistocerca lineata Scudd.-----	6 (Sup.)	398, 402, 414, 417, 418
		425, 433, 435, 436, 441
Schistocerca obscura (F.)-----	6 (Sup.)	425
Schistocerca shoshone Thos.-----	6 (Sup.)	390, 417, 418
Schistocerca sp.-----	6 (Sup.)	417
Schistoceros hamatus (F.)-----	7	468, 513
Schizura concinna (A. & S.)-----	6	342
	7	462
	8	534
	9	595
Schizura unicornis (A. & S.)-----	8	561
Sciara inconstans Fitch-----	1	24
Scobicia declivis (Lec.)-----	3	139
	5	311
Scolytus multistriatus (Marsham)-----	4	209
	10	673
Scolytus rugulosus (Ratz.)-----	6	333
	7	462
Scotogramma trifolii (Rott.)-----	5	247
Scymnus sp.-----	3	112
Selenothrips rubrocinctus (Giard)-----	9	596
Sericothrips variabilis (Beach)-----	4	204
Sibine stimulea (Clem.)-----	7	507
Silpha ramosa Say-----	5	285
Silvius quadrivittatus Say-----	6	380
Simulium meridionale Riley-----	4	220
Simulium spp.-----	6	380
	3	574
Simulium vittatum Zett.-----	3	137
	4	220
	6	380
Sira buskii Lubbock-----	7	512
Sira platani Nicolet-----	6	379
	7	512
Sira sp.-----	6	379
Sitodrepa panicea L.-----	6	382
(Changed to Stegobium paniceum (L.))		
Sitona lineatus L.-----	5	243
Sitophilus granarius (L.)-----	9	627
Sitophilus oryza (L.)-----	9	627
Sitotroga cerealella (Oliv.)-----	9	626
Solenopsis geminata (F.)-----	2	84
Solenopsis molesta (Say)-----	6	382
	7	510
Solenopsis saevissima richteri Forel-----	4	222
Solenopsis xyloni McCook-----	1	24
	2	85
	4	222
	6	382
	7	510

<i>Selenopsis xyloni</i> McCook (Cont'd.)-----	3	575
	9	625
<i>Sparaisson pilosum</i> Ashm.-----	10	661
<i>Spharagemon collare</i> (Scudd.)-----	6 (Sup.)	395, 398, 402, 403, 405 407, 410, 411, 414, 417 420, 421, 425, 430, 433 435, 441
<i>Spharagemon equale</i> Say-----	6 (Sup.)	395, 398, 402, 410, 414 420, 425, 427, 430, 433 435, 441
<i>Spharagemon superbum</i> Hebard-----	6 (Sup.)	425
<i>Sphecodina abbottii</i> Swains.-----	6	373
<i>Spilonota ocellana</i> (D. & S.)-----	3	106
	5	263
<i>Steiroxys</i> sp.-----	6	325
<i>Stenopa vulnerata</i> Loew-----	6	532
<i>Stephanitis pyrioides</i> Scott-----	7	503
	8	567
<i>Stephanitis rhododendri</i> Horv.-----	1	26
	5	305
	6	569
<i>Stethophyma lineatum</i> Scudd.-----	6 (Sup.)	407
<i>Stethorus punctum</i> Lec.-----	1	23
<i>Stictocephala festina</i> Say-----	2	61
	4	165
	5	259
	6	332
	7	460
	9	589
<i>Stilpnolia salicis</i> (L.)-----	3	126
	6	363
	7	493
	10	676
<i>Stomacoccus platani</i> Ferris-----	4	212
<i>Stomoxys calcitrans</i> (L.)-----	1	28
	2	50-81
	3	136
	4	218-219
	5	309
	6	379-380
	7	509
	8	572-573
	9	622-623
<i>Strigoderma arboricola</i> F.-----	5	280-281
	6	345
	8	546
<i>Stromatium fulvum</i> Villiers-----	3	577
	10	684
<i>Strymon melinus</i> (Hbn.)-----	6	360
	7	479
	8	556
<i>Suliema helianthana</i> Riley-----	5	306
	6	377

<i>Supella supellectilium</i> Serv.-----	4	224
	7	511
	8	576
<i>Susana cupressi</i> Rohw. & Midd.-----	3	126
<i>Symmerista albifrons</i> (A. & S.)-----	6	558
<i>Syneta albida</i> Lec.-----	6	538
<i>Syntomeida epilais</i> Walk.-----	2	78
	3	133
	6	343
<i>Syntomeida epilais jucundissima</i> Dyar-----	4	215
<i>Syrbula admirabilis</i> (Uhl.)-----	6 (Sup.)	392, 393, 398, 402, 404
		425, 433
<i>Systema elongata</i> F.-----	4	183
<i>Systema taeniata</i> Say-----	2	70
	3	114
	5	276
<i>Tabanidae</i> -----	4	220
	5	309
	8	573
	9	624
<i>Tabanus atratus</i> F.-----	3	137
	4	220
	5	309
<i>Tabanus benedictus</i> Whit.-----	6	380
<i>Tabanus lineola</i> F.-----	3	137
	4	220
	5	309
	6	380
<i>Tabanus lineola scutellaris</i> Walk.-----	6	380
<i>Tabanus punctifer</i> O. S.-----	8	573
<i>Tabanus sonomensis</i> O. S.-----	8	573
<i>Tabanus sulcifrons</i> Macq.-----	6	380
<i>Tabanus trijunctus</i> Walk.-----	4	220
<i>Tachycines asynamorus</i> Adel.-----	4	213
<i>Tachypterellus quadrigibbus</i> (Say)-----	5	265
	8	536
<i>Taeniothrips inconsequens</i> (Uzel)-----	3	110
	4	178
<i>Taeniothrips simplex</i> (Morison)-----	1	25
	3	132
	4	214-215
	5	304
	6	375
	7	504
	8	568
<i>Taniva albolineana</i> Kearf.-----	3	129
<i>Tarachidia heonix</i> Dyar-----	10	684
<i>Tarsonemus pallidus</i> Banks-----	1	27
<i>Telea polyphemus</i> Cram.-----	8	558
<i>Telenomus</i> sp.-----	8	539
<i>Tenebroides mauritanicus</i> (L.)-----	7	513
	9	627

Tephritis finalis Loew-----	8	568
Terastia meticulosalis Guen.-----	9	617
Tetraleurodes mori (Quaint.)-----	9	618
Tetramorium caespitum (L.)-----	2	84
	6	381
	7	510
Tetranychus pacificus McG.-----	4	180
	8	535
Tetranychus sexmaculatus Riley-----	2	68
	3	112
Tetranychus sp.-----	6	372
Tetranychus telarius (L.)-----	1	10, 19-20
	2	56-57
	3	120, 131
	4	198
	5	250
	6	362
	7	453, 491
	9	584
Tetranychus willamettei McG.-----	4	180
	8	535
Tetrastichus asparagi Crawl.-----	5	283
Tettigoniidae-----	6 (Sup.)	441
Thalessa lunator F.-----	9	610
Theobaldia inornata (Will.)-----	1	27
Thrips tabaci Lind.-----	3	119, 124
	4	169, 196, 204
	5	284
	6	353-354, 375
	7	484
	8	549
	9	603
Thyridopteryx ephemeraeformis (Haw.)-----	5	294
	6	315, 364-365
	7	494
	9	610
	10	675
Thyanta custator F.-----	5	250
	8	540
Thylodrias contractus Mots.-----	7	512
Thysanoptera-----	1	24
	3	108, 124
	4	148, 169, 204, 212-213
		217
	5	291
	6	374, 375
	7	505
Timarcha intricata Hald.-----	4	197
	5	285
Tingidae-----	7	505
Tipulidae-----	1	10
	2	56
	3	122
	4	224

Tischeria malifoliella Clem-----	6	335
Tomostethus multicinctus Rohw.-----	4	208
Tortricidae-----	4	180
Toumeyella numismaticum P. & McD.-----	7	500
	8	564
	9	614
Toumeyella liriodendri Gmel.-----	3	130
	9	615
Toxoptera graminum Rond.-----	2	51,58
	3	98
	4	161
Toxotrypana curvicauda Gerst.-----	4	182
	9	596
Trachelus tabidus (F.)-----	9	587
Trachyphloeus bifoveolatus Beck-----	10	685
Trachyrhachis kiowa Thos.-----	6 (Sup.)	390, 391, 395, 398, 402
		403, 407, 410, 414, 415
		417, 420, 421, 422, 425
		430, 433, 434, 435, 441
Trachyrhachis kiowa fuscifrons (Stal)-----	6 (Sup.)	425
Tremex columba (L.)-----	9	610
Trialeurodes abutilonea Hald.-----	8	557
Trialeurodes vaporariorum (Westw.)-----	3	114, 115
	6	355
	8	543, 566
Trialeurodes variabilis Quaint.-----	4	182
	9	596
Triaspis thoracicus Curt.-----	10	663
Tribolium castaneum (Hbst.)-----	9	627
Tribolium madens Charp.-----	4	224
Tribolium spp.-----	9	627
Trichodectes equi (L.)-----	2	83
Trichogramma spp.-----	3	102
	4	167
	5	260
	7	461
	8	534
Trifidaphis phaseoli Pass.-----	3 (Sup.)	146
	4	203
Trimerotropis agrestis McN.-----	6 (Sup.)	395, 414
Trimerotropis campestris McN.-----	6 (Sup.)	410, 441
Trimerotropis citrina Scudd.-----	6 (Sup.)	425, 426
Trimerotropis gracilis Thos.-----	6 (Sup.)	435, 441
Trimerotropis laticincta Sauss.-----	6 (Sup.)	395, 396, 402, 403, 417
		420, 441
Trimerotropis latifasciata laticincta Sauss.---	6 (Sup.)	425
Trimerotropis pallidipennis Burm.-----	6 (Sup.)	390, 391, 395, 410, 414
		417, 418, 425, 435, 436
		441
Trimerotropis pistrinaria Sauss.-----	6 (Sup.)	420, 441
Trimerotropis sparsa Thos.-----	6 (Sup.)	441
Trimerotropis strenua McN.-----	6 (Sup.)	435
Trioza diospyri (Ashm.)-----	6	343
	7	472

<i>Trirhabda brevicollis</i> Lec.-----	3	129
<i>Troctes divinatorius</i> Mull.-----	7	513
<i>Trombicula irritans</i> (Riley)-----	2	79
(Changed to <i>Eutrombicula alfreddugesi</i> (Oud.))		
	5	307
	6	379
	7	507
<i>Tropaea luna</i> (L.)-----	2	56
<i>Tropodolophus formosus</i> Say-----	6 (Sup.)	395
<i>Trypoxylon clavatus</i> Say-----	7	511
<i>Tyloderma fragariae</i> (Riley)-----	7	484
	8	550
<i>Typhaea fumata</i> L.-----	8	577
	9	627
<i>Typhaea stercorea</i> L.-----	7	512
<i>Typhlocyba pomaria</i> McAtee-----	4	174-175
	5	264-265
	8	537
	9	592
<i>Typhlocyba rosae</i> (L.)-----	9	594
<i>Typophorus viridicyaneus</i> Crotch-----	5	284
<i>Utetheisa bella</i> L.-----	6	332
<i>Vanessa cardui</i> (L.)-----	3	93
<i>Xanthippus corallipes</i> Hald.-----	6 (Sup)	390, 391, 414, 433
<i>Xanthippus corallipes latefasciatus</i> Scudd.-----	6 (Sup.)	420
<i>Xanthippus corallipes pantherinus</i> Scudd.-----	6 (Sup.)	425
<i>Xanthopastis tinaiis</i> Cramer-----	3	132
	4	215
<i>Xenopsylla cheopis</i> (Rothsch.)-----	7	508
	10	685
<i>Xestobium rufovillosum</i> Deg.-----	2	85
<i>Xyloryctes satyrus</i> F.-----	8	560
<i>Xylocrius agassizi</i> Lec.-----	4	179
<i>Zenillia caesar</i> Ald.-----	9 (Sup.)	650, 654
<i>Zenillia mitis</i> Meig.-----	9 (Sup.)	636
<i>Zenillia roseanae</i> B. B.-----	9 (Sup.)	636
<i>Zenillia</i> sp.-----	9 (Sup.)	651

The common names approved by the American Association of Economic Entomologists are indicated by the letters a.n.o. (American name, official).

Alfalfa caterpillar a.n.o.-----	Eurymus eurythene (Bdv.) (Changed to Colias eurythene (Bdv.))
Alfalfa weevil a.n.o.-----	Hypera postica (Gyll.)
American dog tick a.n.o.-----	Dermacentor variabilis (Say)
Angoumois grain moth a.n.o.-----	Sitotroga cerealella (Oliv.)
Apple curculio a.n.o.-----	Tachypterellus quadrigibbus (Say)
Apple flea weevil a.n.o.-----	Orchestes pallicornis Say (Changed to Rhynchaenus pallicornis (Say))
Apple leaf skeletonizer a.n.o.-----	Psorosina hammondi (Riley)
Apple leaf trumpet miner a.n.o.-----	Tischeria malifoliella Clem.
Apple maggot a.n.o.-----	Rhagoletis pomonella (Walsh)
Apple seed chalcid a.n.o.-----	Callimome druparum (Boh.)
Apple twig borer a.n.o.-----	Schistoceros hamatus (F.)
Arborvitae aphid-----	Lachnus thujafilina Del G.
Arborvitae leaf miner a.n.o.-----	Argyresthia thuiella (Pack.)
Army cutworm a.n.o.-----	Chorizagrotis auxiliaris (Grote)
Armyworm a.n.o.-----	Cirphis unipuncta Haw.
Asiatic garden beetle a.n.o.-----	Autoserica castanea (Arrow)
Asparagus beetle a.n.o.-----	Crioceris asparagi (L.)
Avocado red mite a.n.o.-----	Paratetranychus yothersi McG.
Azalea lacebug-----	Stephanitis pyricides Scott
Azalea leaf miner-----	Gracilaria azaleella Brants
Azalea scale-----	Eriococcus azaleae Comst.
Bagworm a.n.o.-----	Thyridopteryx epheneraeformis (Haw.)
Banded ash borer-----	Neoclytus caprea Say
Banded cucumber beetle a.n.o.-----	Diabrotica balteata Lec.
Bat bug-----	Cinex pilosellus Horv.
Bean aphid a.n.o.-----	Aphis rumicis L.
Bean leaf beetle a.n.o.-----	Cerotoma trifurcata (Forst.)
Bean leaf roller a.n.o.-----	Goniurus proteus (L.) (Changed to Urbanus proteus (L.))
Bean weevil a.n.o.-----	Acanthoscelides obtectus (Say)
Bedbug a.n.o.-----	Cinex lectularius L.
Beech scale a.n.o.-----	Cryptococcus fagi (Baer.)
Beet armyworm a.n.o.-----	Laphygma exigua (Hbn.)
Beet leafhopper a.n.o.-----	Eutettix tenellus (Bak.)
Beet webworm a.n.o.-----	Loxostege sticticalis (L.)
Bella moth-----	Utetheisa bella L.
Birch leaf miner-----	Fenusa pumila Klug
Biting cat louse-----	Bovicola subrostratus Nitz.
Black blowfly-----	Phormia regina Meig.
Black cherry aphid a.n.o.-----	Myzus cerasi (F.)
Black grain stem sawfly a.n.o.-----	Trachelus tabidus (F.)
Black Hills beetle a.n.o.-----	Dendroctonus ponderosae Hopk.
Black-legged tick a.n.o.-----	Ixodes ricinus scapularis Say
Black peach aphid a.n.o.-----	Anuraphis persicae-niger (Smith)
Black pecan aphid a.n.o.-----	Melanocallis caryaefoliae (Davis)
Black scale a.n.o.-----	Saissetia oleae (Bern.)
Black turpentine beetle a.n.o.-----	Dendroctonus terebrans (Oliv.)
Black vine weevil a.n.o.-----	Brachyrhinus sulcatus (F.)
Black widow spider a.n.o.-----	Latrodectus mactans (F.)

Boll weevil a.n.o.-----	<i>Anthrenus grandis</i> Boh.
Bollworm a.n.o.-----	<i>Heliothis obsoleta</i> (F.)
Booklouse a.n.o.-----	<i>Troctes divinatorius</i> (Mull.)
Boxelder bug a.n.o.-----	<i>Leptocoris trivittatus</i> (Say)
Boxwood leaf miner a.n.o.-----	<i>Monarthropalpus buxi</i> Laboulb.
Boxwood psyllid a.n.o.-----	<i>Psylla buxi</i> (L.)
Bronzed birch borer a.n.o.-----	<i>Agrilus anxius</i> Gory
Brown-banded cockroach-----	<i>Supella supelleotilium</i> Serv.
Brown dog tick a.n.o.-----	<i>Rhipicephalus sanguineus</i> (Latr.)
Brown spider beetle a.n.o.-----	<i>Ptinus brunneus</i> Duft.
Brown-tail moth a.n.o.-----	<i>Nygmia phaeorrhoea</i> (Donov.)
Buck moth a.n.o.-----	<i>Hemileuca maia</i> (Drury)
Buffalo gnats-----	<i>Eusimulium</i> sp.
Buffalo treehopper a.n.o.-----	<i>Ceresa bubalus</i> (F.)
Bulb mite a.n.o.-----	<i>Rhizoglyphus hyacinthi</i> Bdv.
Bumble flower beetle a.n.o.-----	<i>Euphoria inda</i> (L.)
Cabbage aphid a.n.o.-----	<i>Brevicoryne brassicae</i> (L.)
Cabbage curculio a.n.o.-----	<i>Ceutorhynchus rapae</i> Gyll.
Cabbage looper a.n.o.-----	<i>Autographa brassicae</i> (Riley)
Cabbage maggot a.n.o.-----	<i>Hyalleria brassicae</i> (Bouche)
Cabbage shoot weevil-----	<i>Ceutorhynchus assinilis</i> Payk.
Cabbage webworm a.n.o.-----	<i>Mellula undalis</i> (F.)
California red scale a.n.o.-----	<i>Chrysomphalus aurantii</i> (Mask.) (Changed to <i>Aonidiella aurantii</i> (Mask.))
California tent caterpillar a.n.o.---	<i>Malacosoma californica</i> (Pack.)
Carpenter worm a.n.o.-----	<i>Prionoxystus robiniae</i> (Pack)
Carrot beetle a.n.o.-----	<i>Ligyrus gibbosus</i> (D g.)
Carrot weevil a.n.o.-----	<i>Listronotus latiusculus</i> (Boh.)
Catalpa sphinx a.n.o.-----	<i>Ceratomia catalpae</i> (Bdv.)
Cattle biting-louse a.n.o.-----	<i>Bovicola bovis</i> (L.)
Cecropia moth a.n.o.-----	<i>Platysamia cecropia</i> (L.) (Changed to <i>Samia cecropia</i> (L.))
Cedar bark beetle-----	<i>Phloeosinus cristatus</i> Lec.
Changa a.n.o.-----	<i>Scapteriscus vicinus</i> Scudd.
Cherry fruitfly a.n.o.-----	<i>Rhagoletis cingulata</i> (Loew)
Cherry leaf miner-----	<i>Profenusa collaris</i> MacG.
Cherry maggot a.n.o.-----	<i>Rhagoletis cingulata</i> (Loew)
Chigger a.n.o.-----	<i>Trombicula irritans</i> (Riley) (Changed to <i>Eutrombicula alfreddugesi</i> (Oud.))
Chinch bug a.n.o.-----	<i>Blissus leucopterus</i> (Say)
Chrysanthemum aphid a.n.o.-----	<i>Macrosiphoniella sanborni</i> (Gill.)
Chrysanthemum gall midge a.n.o.-----	<i>Diarthronomyia hypogaea</i> (Loew)
Chrysanthemum leaf miner a.n.o.-----	<i>Phytomyza chrysanthemi</i> (Korarz)
Cigar casebearer a.n.o.-----	<i>Coleophora Fletcherella</i> Fern.
Cigarette beetle a.n.o.-----	<i>Lasioderma serricorne</i> (F.)
Citrus mealybug a.n.o.-----	<i>Pseudococcus citri</i> (Risso)
Citrus red mite a.n.o.-----	<i>Paratetranychus citri</i> McG.
Citrus root weevil-----	<i>Pachnaeus opalus</i> Oliv.
Citrus rust mite a.n.o.-----	<i>Phyllocoptes oleivorus</i> Ashm.
Citrus whitefly a.n.o.-----	<i>Dialeurodes citri</i> (Ashm.)
Clover hay worm a.n.o.-----	<i>Hypsopygia costalis</i> (F.)
Clover leaf weevil a.n.o.-----	<i>Hypera punctata</i> (F.)
Clover mite a.n.o.-----	<i>Bryobia praetiosa</i> Koch

Clover root borer a.n.o.-----	<i>Hylastinus obscurus</i> (Marsh.)
Clover seed chalcid a.n.o.-----	<i>Bruchophagus gibbus</i> (Boh.)
Clover seed midge a.n.o.-----	<i>Dasyneura leguminicola</i> (Lint.)
Clover stem borer a.n.o.-----	<i>Languria mozardi</i> Latr.
Cluster fly a.n.o.-----	<i>Pollenia rudis</i> (F.)
Codling moth a.n.o.-----	<i>Carpocapsa pomonella</i> (L.)
Colorado potato beetle a.n.o.-----	<i>Leptinotarsa decemlineata</i> (Say)
Columbine borer a.n.o.-----	<i>Papaipema purpurifascia</i> (G. & R.)
Columbine leaf miner-----	<i>Phytomyza minuscula</i> Gour.
Common cattle grub a.n.o.-----	<i>Hypoderma lineatum</i> (DeVill.)
Common red spider a.n.o.-----	<i>Tetranychus telarius</i> (L.)
Comstock's mealybug-----	<i>Pseudococcus comstocki</i> Comst.
Corn ear worm a.n.o.-----	<i>Heliothis obsoleta</i> (F.)
Corn flea beetle a.n.o.-----	<i>Chaetocnema pulicaria</i> Melsh.
Corn lantern fly-----	<i>Peregrinus maidis</i> Ashm.
Corn leaf aphid a.n.o.-----	<i>Aphis maidis</i> Fitch
Corn root webworm a.n.o.-----	<i>Crambus caliginosellus</i> Glen.
Corn rootworm a.n.o.-----	<i>Diabrotica longicornis</i> (Say)
Cotton flea hopper a.n.o.-----	<i>Psallus seriatus</i> (Reut.)
Cotton leaf perforator a.n.o.-----	<i>Bucculatrix thurberiella</i> Busck
Cotton leaf worm a.n.o.-----	<i>Alabama argillacea</i> (Hbn.)
Cotton square borer a.n.o.-----	<i>Strymon melinus</i> (Hbn.)
Cotton stainer a.n.o.-----	<i>Dysdercus suturellus</i> (H. S.)
Cottonwood borer-----	<i>Plectrodera scalator</i> F.
Cottonwood leaf beetle a.n.o.-----	<i>Chrysomela scripta</i> F.
Cottony-cushion scale a.n.o.-----	<i>Icerya purchasi</i> Mask.
Cottony maple scale a.n.o.-----	<i>Pulvinaria vitis</i> (L.)
Cottony cypress scale-----	<i>Ehrhornia cupressi</i> Ehr.
Cowpea aphid a.n.o.-----	<i>Aphis medicaginis</i> Koch
Cowpea curculio a.n.o.-----	<i>Chalcodermus aeneus</i> Boh.
Crapemyrtle aphid a.n.o.-----	<i>Myzocallis kahawaluokalani</i> Kirk.
Curl'd rose sawfly a.n.o.-----	<i>Emphytus cinctipes</i> Nort. (Changed to <i>Allantus cinctus</i> (L.))
Currant aphid a.n.o.-----	<i>Capitophorus ribis</i> (L.)
Currant spanworm a.n.o.-----	<i>Itameribearia</i> (Fitch)
Cyclamen mite a.n.o.-----	<i>Tarsonemus pallidus</i> Banks
Deodar weevil a.n.o.-----	<i>Pissodes nemorensis</i> Germ.
Destructor scale-----	<i>Aspidiotus destructor</i> Sign.
Diamondback moth a.n.o.-----	<i>Plutella maculipennis</i> (Curt.)
Dingy cutworm a.n.o.-----	<i>Feltia subgothica</i> (Haw.)
Douglas fir beetle a.n.o.-----	<i>Dendroctonus pseudotsugae</i> Hopk.
Douglas fir tussock moth a.n.o.-----	<i>Hemerocampa pseudotsugata</i> McD.
Dried fruit beetle a.n.o.-----	<i>Carpophilus hemipterus</i> (L.)
Drug store weevil a.n.o.-----	<i>Sitodrepa panicea</i> (L.) (Changed to <i>Stegobium paniceum</i> (L.))
Ear tick a.n.o.-----	<i>Ornithodoros megnini</i> Duges
Early strawberry slug-----	<i>Empria gregariae</i> Rohw.
Eastern spruce beetle a.n.o.-----	<i>Dendroctonus piceaperda</i> Hopk.
Eastern tent caterpillar a.n.o.-----	<i>Malacosoma americana</i> (F.)
Eggplant lacebug a.n.o.-----	<i>Gargaphia solani</i> Heid.
Eight-spotted forester a.n.o.-----	<i>Alypia octomaculata</i> (F.)
Elm lacebug-----	<i>Corythucha ulmi</i> O. & D.
Elm leaf beetle a.n.o.-----	<i>Galerucella xanthomelaena</i> (Schr.)

Elm sawfly a.n.o.-----	<i>Cimbex americana</i> Leach
Elm scurfy scale a.n.o.-----	<i>Chionaspis americana</i> Johns.
Elm spanworm a.n.o.-----	<i>Eanomus subsignarius</i> (Hbn.)
Euonymus scale a.n.o.-----	<i>Chionaspis euonymi</i> Comst.
European chicken flea a.n.o.-----	<i>Ceratophyllus gallinae</i> Schr.
European corn borer a.n.o.-----	<i>Pyrausta nubilalis</i> (Hbn.)
European earwig a.n.o.-----	<i>Forficula auricularia</i> L.
European elm scale a.n.o.-----	<i>Gossyparia spuria</i> (Mod.)
European fruit lecanium a.n.o.-----	<i>Lecanium corni</i> Bouche
European peach scale a.n.o.-----	<i>Lecanium persicae</i> (F.)
European pine shoot moth a.n.o.-----	<i>Rhyacionia buoliana</i> (Schiff.)
European red mite a.n.o.-----	<i>Paratetranychus pilosus</i> (C. & F.)
European spruce sawfly a.n.o.-----	<i>Diprion polytorum</i> (Htg.)
European wheat stem sawfly a.n.o.-----	<i>Cophus pygmaeus</i> (L.)
European willow leaf beetle-----	<i>Plagiodera versicolora</i> Laich
Eye-spotted budmoth a.n.o.-----	<i>Spilonota ocellana</i> (D. & S.)
Fall armyworm a.n.o.-----	<i>Laphygma frugiperda</i> (A. & S.)
Fall cankerworm a.n.o.-----	<i>Alsophila pomataria</i> (Harr.)
Fall webworm a.n.o.-----	<i>Hyphantria cunea</i> (Drury)
False chinch bug a.n.o.-----	<i>Nysius ericae</i> (Schill.)
False potato beetle a.n.o.-----	<i>Leptinotarsa juncta</i> (Germ.)
False wireworms-----	<i>Eleodes</i> spp.
Feather mite-----	<i>Liponyssus sylviarum</i> C. & F.
Fickle midge-----	<i>Sciata inconstans</i> Fitch
Field cricket a.n.o.-----	<i>Gryllus assimilis</i> F.
Fire ant a.n.o.-----	<i>Solenopsis geninata</i> (F.)
Flatheaded apple tree borer a.n.o.-----	<i>Chrysobothris femorata</i> (Oliv.)
Florida red scale a.n.o.-----	<i>Chrysomphalus aonidum</i> (L.)
Flower thrips a.n.o.-----	<i>Frankliniella tritici</i> (Fitch)
Forest tent caterpillar a.n.o.-----	<i>Malacosoma disstria</i> Hbn.
Four-lined plant bug a.n.o.-----	<i>Poecilocapsus lineatus</i> (F.)
Fowl tick a.n.o.-----	<i>Argas miniatus</i> Koch
Fruit tree leaf roller a.n.o.-----	<i>Cacoecia argyrospila</i> (Walk.)
Fuller's rose beetle a.n.o.-----	<i>Pantomorus godmani</i> (Crotch)
Garden flea hopper a.n.o.-----	<i>Halticus citri</i> (Ashm.)
Garden springtail a.n.o.-----	<i>Bourletiella hortensis</i> (Fitch)
Garden webworm a.n.o.-----	<i>Loxostege similalis</i> (Guen.)
Gladiolus thrips a.n.o.-----	<i>Taeniothrips simplex</i> Morison
Golden oak scale-----	<i>Asterolecanium variolosum</i> Ratz.
Goldsmith beetle-----	<i>Cotalpa lanigera</i> L.
Gouty oak gall-----	<i>Andricus punctatus</i> Bass.
Gouty vein gall-----	<i>Dasyneura communis</i> Felt
Grape berry moth a.n.o.-----	<i>Polychrosis viteana</i> (Clen.)
Grape colaspis a.n.o.-----	<i>Colaspis brunnea</i> (F.)
Grape leaf folder a.n.o.-----	<i>Desmia funeralis</i> (Hbn.)
Grape leafhopper a.n.o.-----	<i>Erythroneura comes</i> (Say)
Grape mealybug a.n.o.-----	<i>Pseudococcus maritimus</i> (Ehrh.)
Grape phylloxera a.n.o.-----	<i>Phylloxera vitifoliae</i> (Fitch)
Grape plume moth a.n.o.-----	<i>Oxyptilus periscelidactylus</i> (Fitch) (Changed to <i>Pterophorus periscelidactylus</i> Fitch)
Grape sawfly a.n.o.-----	<i>Erythrastides pygmaea</i> (Say)
Grape tomato gall-----	<i>Lasioptera vitis</i> O. S.

Grapevine aphid a.n.o.-----	<i>Aphis illinoisensis</i> Shim.
Grass thrips a.n.o.-----	<i>Anaphothrips obscurus</i> (Mull.)
Green bug a.n.o.-----	<i>Toxoptera graminum</i> Rond.
Green citrus aphid-----	<i>Aphis spiraeicola</i> Patch
Green clover worm a.n.o.-----	<i>Plathypena scabra</i> (F.)
Green fruitworm a.n.o.-----	<i>Graptolitha antennata</i> (Walk.)
Green June beetle a.n.o.-----	<i>Cotinis nitida</i> (L.)
Green peach aphid a.n.o.-----	<i>Myzus persicae</i> (Sulz.)
Greenhouse stone cricket a.n.o.-----	<i>Tachycines asynamorus</i> Adel.
Greenhouse whitefly a.n.o.-----	<i>Trialeurodes vaporariorum</i> (Westw.)
Green stinkbug a.n.o.-----	<i>Acrosternum hilare</i> (Say)
Green-striped maple worm a.n.o.-----	<i>Anisota rubicunda</i> F.
Gulf coast tick a.n.o.-----	<i>Amblyomma maculatum</i> Koch
Gypsy moth a.n.o.-----	<i>Porthetria dispar</i> (L.)
Hackberry nipple gall a.n.o.-----	<i>Pachypsylla celtidis-mamma</i> Riley
Hairy chinch bug a.n.o.-----	<i>Blissus hirtus</i> Montd.
Harlequin bug a.n.o.-----	<i>Murgantia histrionica</i> (Hahn)
Hemlock looper a.n.o.-----	<i>Ellopiia fiscellaria</i> Guen.
Hessian fly a.n.o.-----	<i>Phytophaga destructor</i> (Say)
Hickory-nut curculio-----	<i>Conotrachelus affinis</i> Boh.
Hickory shuck worm a.n.o.-----	<i>Laspeyresia caryana</i> (Fitch)
Hog louse a.n.o.-----	<i>Haematopinus suis</i> (L.) (Changed to <i>Haematopinus adventicius</i> Neum.)
Holly budmoth-----	<i>Rhopobota naevana ilicifoliana</i> Kearf.
Holly leaf miner a.n.o.-----	<i>Phytomyza ilicis</i> Curt.
Hop aphid a.n.o.-----	<i>Phorodon humili</i> (Schr.)
Hop flea beetle a.n.o.-----	<i>Psylliodes punctulata</i> Melsh.
Horn fly a.n.o.-----	<i>Haematobia irritans</i> L.
Horse biting louse a.n.o.-----	<i>Trichodectes equi</i> (L.)
Horse botfly a.n.o.-----	<i>Gasterophilus intestinalis</i> (Deg.)
House cricket a.n.o.-----	<i>Gryllus domesticus</i> L.
Howard's scale a.n.o.-----	<i>Aspidiotus howardi</i> Ckll.
Imbricated snout beetle a.n.o.-----	<i>Epicaerus imbricatus</i> (Say)
Imported cabbage worm-----	<i>Pieris rapae</i> (L.)
Imported currant worm a.n.o.-----	<i>Pteronidea ribesii</i> (Scop.)
Indian-meal moth a.n.o.-----	<i>Plodia interpunctella</i> (Hbn.)
Introduced pine sawfly a.n.o.-----	<i>Diprion simile</i> (Htg.)
Iris borer a.n.o.-----	<i>Macronoctus onusta</i> Grote
Japanese beetle a.n.o.-----	<i>Popillia japonica</i> Newm.
Juniper scale-----	<i>Diaspis caruoli</i> Targ.
Juniper webworm-----	<i>Dichomeris marginellus</i> F.
Larch casebearer a.n.o.-----	<i>Coleophora laricella</i> Hbn.
Larch sawfly a.n.o.-----	<i>Lygaeonematus erichsonii</i> (Htg.)
Latania scale-----	<i>Aspidiotus lataniae</i> Sign.
Lead cable borer a.n.o.-----	<i>Scobicia declivis</i> (Lec.)
Leaf crumpler a.n.o.-----	<i>Mineola indigenella</i> (Zell.)
Leaf-footed bug a.n.o.-----	<i>Leptoglossus phyllopus</i> (L.)
Lesser apple worm a.n.o.-----	<i>Grapholitha prunivora</i> (Walsh)
Lesser bulb fly a.n.o.-----	<i>Eumerus tuberculatus</i> Rond.

Lesser cornstalk borer a.n.o.-----
 Lilac borer a.n.o.-----
 Lilac leaf miner a.n.o.-----
 Lime-tree looper a.n.o.-----
 Locust borer a.n.o.-----
 Locust leaf miner a.n.o.-----
 Locust twig borer-----
 Lodgepole needle miner a.n.o.-----
 Lone star tick a.n.o.-----
 Long-nosed cattle louse-----
 Luna moth a.n.o.-----

Magnolia scale a.n.o.-----
 Maple bladder gall-----
 Maple borer-----
 Margined blister beetle a.n.o.-----
 Meadow plant bug a.n.o.-----
 Mediterranean fig scale-----
 Melon aphid a.n.o.-----
 Melonworm a.n.o.-----
 Mexican bean beetle a.n.o.-----
 Mormon cricket a.n.o.-----
 Mountain pine beetle a.n.o.-----
 Mourning-cloak butterfly a.n.o.-----
 Mulberry whitefly a.n.o.-----

Nantucket pine shoot moth-----
 Nevada buck-moth-----
 New York weevil a.n.o.-----
 Northern mole cricket a.n.o.-----
 Norway maple aphid a.n.o.-----

Oak club gall-----
 Oak lecanium-----
 Oblique-banded leaf roller a.n.o.-----
 Obscure scale a.n.o.-----
 Oriental rat flea a.n.o.-----
 Oystershell scale a.n.o.-----

Pacific mite-----
 Pale western cutworm a.n.o.-----

Pales weevil a.n.o.-----
 Palm leaf skeletonizer-----
 Pandora moth a.n.o.-----
 Papaya fruitfly a.n.o.-----
 Papaya whitefly-----
 Pavement ant a.n.o.-----
 Pea aphid a.n.o.-----

Pea moth a.n.o.-----
 Pea weevil a.n.o.-----
 Peach borer a.n.o.-----
 Peach twig borer a.n.o.-----
 Pear borer-----

Elasmopalpus lignosellus (Zell.)
Podosesia syringae (Harr.)
Gracilaria syringella F.
Erannis tiliaria (Harr.)
Cyllene robiniae (Forst.)
Chalepus dorsalis Thunb.
Ecdytolopha insiticiaria Zell.
Recurvaria milleri Busck
Amblyomma mericanum (L.)
Linognathus vituli L.
Tropaea luna (L.)

Neolecanium cornuparyum (Thro)
Phyllocoptes quadripes Shin.
Conopia acerni Glen.
Epicauta marginata (F.)
Miris dolabratus (L.)
Lepidosaphes ficus Sign.
Aphis gossypii Glov.
Diaphania hyalinata (L.)
Epilachna varivestis Muls.
Anabrus simplex Hald.
Dendroctonus monticolae Hopk.
Hamadryas antiopa (L.)
Tetraleurodes mori (Quaint.)

Rhyacionia frustrana Comst.
Hemileuca nevadensis Stretch
Ithycerus noveboracensis (Forst.)
Gryllotalpa hexadactyla Perty
Periphyllus lyropictus (Kess.)

Andricus clavulus O. S.
Lecanium quercifex Fitch
Cacoecia rosaceana (Harr.)
Chrysomphalus obscurus (Comst.)
Xenopsylla cheopis (Rothsch.)
Lepidosaphes ulmi L.

Paratetranychus pacificus McG.
Porosagrotis orthogonia (Morr.) (Changed to *Aerotis orthogonia* Morr.)
Hylebius pates (Hbst.)
Homoledra sabalella Chamb.
Coloradia pandora Blake
Toxotrypana curvicauda Gerst.
Tetraleurodes variabilis Quaint.
Tetranorium caespitum (L.)
Illinoia pisi (Kltb.) (Changed to *Macrosiphum pisi* (Kltb.))
Laspeyresia nigricana (Steph.)
Bruchus pisorum (L.)
Conopia exitiosa (Say)
Anarsia lineatella Zell.
Conopia pyri Harr.

Pear leaf blister mite a.n.o.-----	<i>Eriophyes pyri</i> Pgst.
Pear leaf-rolling midge-----	<i>Dasyneura pyri</i> Kieff.
Pear psylla a.n.o.-----	<i>Psylla pyricola</i> (Foerst.)
Pear slug a.n.o.-----	<i>Eriocampoides limacina</i> Ratz. (Changed to <i>Caliroa cerasi</i> (L.))
Pear thrips a.n.o.-----	<i>Taeniothrips inconsequens</i> (Uzel)
Pecan budmoth a.n.o.-----	<i>Gretchena bolliana</i> (Sling.)
Pecan cigar casebearer a.n.o.-----	<i>Coleophora caryaefoliella</i> Clem.
Pecan leaf casebearer a.n.o.-----	<i>Acrobasis juglandis</i> (LeB.)
Pecan nut casebearer a.n.o.-----	<i>Acrobasis caryae</i> Grote
Pecan phylloxera a.n.o.-----	<i>Phylloxera devastatrix</i> Perg.
Pecan weevil a.n.o.-----	<i>Curculio caryae</i> (Horn)
Pepper weevil a.n.o.-----	<i>Anthonomus eugenii</i> Cano
Periodical cicada a.n.o.-----	<i>Magicicada septendecim</i> (L.)
Persimmon psylla a.n.o.-----	<i>Trioza diospyri</i> (Ashm.)
Pickleworm a.n.o.-----	<i>Diaphania nitidalis</i> (Stoll)
Pigeon tremex a.n.o.-----	<i>Tremex columba</i> (L.)
Pine aphid-----	<i>Cinara strobi</i> Fitch
Pine bark aphid a.n.o.-----	<i>Pineus strobi</i> (Htg.)
Pine needle scale a.n.o.-----	<i>Chionaspis pinifoliae</i> (Fitch)
Pine tube moth a.n.o.-----	<i>Argyrotaenia pinatubana</i> (Kearf.)
Pineapple mealybug a.n.o.-----	<i>Pseudococcus brevipes</i> Ckll.
Pink bollworm a.n.o.-----	<i>Pectinophora gossypiella</i> (Saund.)
Pink corn worm-----	<i>Pyroderces rileyi</i> Wlsm.
Pistol casebearer a.n.o.-----	<i>Coleophora malivorella</i> Riley
Pitch-eating weevil-----	<i>Pachylobius picivorus</i> Germ.
Pitch mass borer-----	<i>Parharmonia pini</i> Kellicott
Pitch twig moth a.n.o.-----	<i>Petrova comstockiana</i> (Fern.)
Plum curculio a.n.o.-----	<i>Conotrachelus nenuphar</i> (Hbst.)
Plum gouger a.n.o.-----	<i>Anthonomus scutellaris</i> Lec.
Polka-dot wasp moth-----	<i>Syntomeida epilais</i> Walk.
Poplar and willow borer a.n.o.-----	<i>Cryptorhynchus lapathi</i> (L.) (Changed to <i>Sternochaetus lapathi</i> (L.))
Poplar borer a.n.o.-----	<i>Saperda calcarata</i> Say
Poplar leaf beetle-----	<i>Phytodecta pallida</i> L.
Poplar tentmaker-----	<i>Ichthyura inclusa</i> Hbn.
Poplar vagabond aphid a.n.o.-----	<i>Mordwilkoja vagabunda</i> Walsh
Potato aphid a.n.o.-----	<i>Illinoia solanifolii</i> Ashm. (Changed to <i>Macrosiphum solanifolii</i> (Ashm.))
Potato flea beetle a.n.o.-----	<i>Epitrix cucumeris</i> (Harr.)
Potato leafhopper a.n.o.-----	<i>Empoasca fabae</i> (Harr.)
Potato psyllid-----	<i>Paratrioza cockerelli</i> Sulc.
Potato tuber worm a.n.o.-----	<i>Gnorimoschema operculella</i> (Zell.)
Prickly-ash beetle-----	<i>Trirhabda brevicollis</i> Lec.
Privet thrips-----	<i>Dendrothrips ornatus</i> Jabl.
Purple scale a.n.o.-----	<i>Lepidosaphes beckii</i> (Newm.)
Rabbit flea-----	<i>Hoplopsyllus affinis</i> Baker
Rabbit tick a.n.o.-----	<i>Haemaphysalis leporis-palustris</i> Pack.
Raisin moth a.n.o.-----	<i>Ephestia figulilella</i> Greg.
Rapid plant bug a.n.o.-----	<i>Adelphocoris rapidus</i> (Say)
Raspberry cane borer a.n.o.-----	<i>Oberea bimaculata</i> (Oliv.)
Raspberry cane maggot a.n.o.-----	<i>Pegomya rubivora</i> (Coq.)
Raspberry fruitworm a.n.o.-----	<i>Byturus unicolor</i> Say
Raspberry root borer a.n.o.-----	<i>Bembecia marginata</i> (Harr.)
Raspberry sawfly a.n.o.-----	<i>Monophadnoides rubi</i> (Harr.)

Red-banded leaf roller a.n.o.-----
 Red-banded thrips a.n.o.-----
 Redbud aphid-----
 Red elm bark weevil a.n.o.-----
 Red-headed ash borer a.n.o.-----
 Red-humped caterpillar a.n.o.-----
 Red-necked cane borer a.n.o.-----
 Red-shouldered plant bug-----
 Rhododendron borer-----
 Rhododendron lacebug a.n.o.-----
 Rhubarb curculio a.n.o.-----
 Ring-legged earwig a.n.o.-----
 Rocky Mountain spotted-fever tick-----
 Rose aphid a.n.o.-----
 Rose chafer a.n.o.-----
 Rose curculio a.n.o.-----
 Rose leaf beetle a.n.o.-----
 Rose leafhopper a.n.o.-----
 Rose midge a.n.o.-----
 Rose sawfly a.n.o.-----
 Rose scale a.n.o.-----
 Rosy apple aphid a.n.o.-----
 Roundheaded apple tree borer a.n.o.-----
 Roundheaded pine beetle a.n.o.-----
 Rusty plum aphid a.n.o.-----

Saddle-back caterpillar a.n.o.-----
 Salt-marsh caterpillar a.n.o.-----
 San Jose scale a.n.o.-----
 Satin moth a.n.o.-----
 Saw-toothed grain beetle a.n.o.-----
 Scotch pine lecanium-----
 Scotch pine weevil-----
 Screwworm a.n.o.-----
 Scurfy scale a.n.o.-----
 Secondary screwworm a.n.o.-----
 Seed-corn maggot a.n.o.-----
 Serpentine leaf miner a.n.o.-----
 Sheep biting-louse-----
 Sheep botfly a.n.o.-----
 Sheep scab mite a.n.o.-----
 Sheep tick a.n.o.-----
 Short-nosed cattle louse a.n.o.-----
 Shot-hole borer a.n.o.-----
 Silver-spotted skipper-----
 Six-spotted grape beetle-----
 Six-spotted mite a.n.o.-----
 Smaller European elm bark beetle a.n.o.-----
 Snowball aphid a.n.o.-----
 Snowy tree cricket a.n.o.-----
 Soft scale a.n.o.-----
 Sorghum webworm a.n.o.-----
 Southern armyworm a.n.o.-----
 Southern corn rootworm a.n.o.-----

Argyrotaenia velutinana (Walk.)
Solenothrips rubrocinctus (Giard)
Aphis pawneepae Hottes
Magdalis armicollis (Say)
Neoclytus acuminatus (F.)
Schizura concinna (A. & S.)
Agrilus ruficollis (F.)
Thyanta custator F.
Conopia rhododendri Beut.
Stephanitis rhododendri Horv.
Lixus concavus Say
Euborellia annulipes (Lucas)
Dermacentor andersoni Stiles
Macrosiphum rosae L.
Macroductylus subspinosus (F.)
Rhynchites bicolor (F.)
Nodonota puncticollis Say
Typhlocyba rosae (L.)
Dasyneura rhodophaga (Coq.)
Caliroa aethiops (F.)
Aulacaspis rosae (Bouche)
Anuraphis roseus Baker
Saperda candida F.
Dendroctonus convexifrons Hopk.
Hysteroneura setariae (Thos.)

Sibine stimulea (Clem.)
Estigmene acraea (Drury)
Aspidiotus perniciosus Comst.
Stilpnotia salicis (L.)
Oryzaephilus surinamensis (L.)
Toumeyella munismaticum P. & McD.
Hylobius radicis Buchanan
Cochliomyia americana C. & F.
Chionaspis furfura (Fitch)
Cochliomyia macellaria F.
Hylemya cilicrura (Rond.)
Agropyza pusilla Meig.
Bovicola ovis L.
Oestris ovis L.
Psoroptes ovis Her.
Melophagus ovinus (L.)
Haematopinus eurysternus Nitz.
Scolytus rugulosus (Ratz.)
Epargyreus tityrus F.
Pelidnota punctata L.
Tetranychus sexmaculatus Riley
Scolytus multistriatus (Marshan)
Aphis viburnicola Gill.
Oecanthus niveus Deg.
Coccus hesperidum L.
Celama sorghiella (Riley)
Prodenia eridania (Cran.)
Diabrotica duodecimpunctata (F.)

Southern green stinkbug a.n.o.-----	<i>Nezara viridula</i> (L.)
Southern mole cricket a.n.o.-----	<i>Scapteriscus acletus</i> R. & H.
Southern pine beetle a.n.o.-----	<i>Dendroctonus frontalis</i> Zirm.
Southern pine sawyer a.n.o.-----	<i>Monochamus titillator</i> (F.)
Southwestern corn borer a.n.o.-----	<i>Diatraea grandiosella</i> Dyar
Spinach leaf miner a.n.o.-----	<i>Pegomya hyocyami</i> (Panz.)
Spotted cucumber beetle a.n.o.-----	<i>Diabrotica duodecimpunctata</i> (F.)
Spring cankerworm a.n.o.-----	<i>Paleacrita vernata</i> (Peck)
Spruce aphid a.n.o.-----	<i>Aphis abietina</i> Walk.
Spruce bud scale-----	<i>Physokermes piceae</i> Schr.
Spruce budworm a.n.o.-----	<i>Cacoecia fumiferana</i> (Clem.)
Spruce gall aphid-----	<i>Chermes abietis</i> L.
Spruce mite-----	<i>Paratetranychus uniunguis</i> Jacobi
Spruce needle miner-----	<i>Taniva albolineaeae</i> Kearf.
Squash beetle a.n.o.-----	<i>Epilachna borealis</i> (F.)
Squash borer a.n.o.-----	<i>Melittia satyriniformis</i> Hbn.
Squash bug a.n.o.-----	<i>Anasa tristis</i> (Deg.)
Stablefly a.n.o.-----	<i>Stomoxys calcitrans</i> (L.)
Stalk borer a.n.o.-----	<i>Papaipema nebris nitela</i> (Guen.)
Sticktight flea a.n.o.-----	<i>Echidnophaga gallinacea</i> (Westw.)
Strawberry crown borer a.n.o.-----	<i>Tyloclerma fragariae</i> (Riley)
Strawberry crown moth a.n.o.-----	<i>Conopia bibionipennis</i> (Bdv.)
Strawberry fruitworm a.n.o.-----	<i>Cnephasia longana</i> (Haw.)
Strawberry leaf roller a.n.o.-----	<i>Ancylis comptana</i> (Froel.)
Strawberry root aphid a.n.o.-----	<i>Aphis forbesi</i> Weed
Strawberry root weevil a.n.o.-----	<i>Brachyrhinus ovatus</i> (L.)
Strawberry weevil a.n.o.-----	<i>Anthonomus signatus</i> (Say)
Striped cucumber beetle a.n.o.-----	<i>Diabrotica vittata</i> (F.)
Sucking dog louse-----	<i>Linognathus piliferus</i> Burn.
Sugar-beet wireworm a.n.o.-----	<i>Limónius californicus</i> (Mann.)
Sugarcane beetle a.n.o.-----	<i>Eutheola rugiceps</i> (Lec.)
Sugarcane borer a.n.o.-----	<i>Diatraea saccharalis</i> (F.)
Sugarcane rootstock weevil-----	<i>Anacentrinus subnudus</i> Buchanan
Sumac flea beetle-----	<i>Blepharida rhois</i> Forst.
Sunflower weevil-----	<i>Rhodoabaenus tredecimpunctatus</i> Ill.
Sweetpotato flea beetle a.n.o.-----	<i>Chaetocnema confinis</i> Crotch
Sweetpotato leaf beetle-----	<i>Typophorus viridicyaneus</i> Crotch
Sweetpotato weevil a.n.o.-----	<i>Cylas formicarius</i> (F.)
Sycamore lacebug-----	<i>Corythucha ciliata</i> Say
Sycamore leaf roller-----	<i>Ancylis platanana</i> Clem.
Tarnished plant bug a.n.o.-----	<i>Lygus pratensis</i> L. (Changed to <i>Lygus pratensis oblineatus</i> (Say))
Terrapin scale a.n.o.-----	<i>Lecanium nigrofasciatum</i> Perg.
Thistle aphid a.n.o.-----	<i>Anuraphis cardui</i> (L.)
Three-cornered alfalfa hopper a.n.o.---	<i>Stictocephala festina</i> (Say)
Three-lined fig borer-----	<i>Ptychodes trilineatus</i> L.
Throat botfly a.n.o.-----	<i>Gasterophilus nasalis</i> (L.)
Thurberia weevil a.n.o.-----	<i>Anthonomus grandis thurberiae</i> Pierce
Tiger swallowtail a.n.o.-----	<i>Papilio glaucus turnus</i> (L.)
Tobacco budworm a.n.o.-----	<i>Heliothis virescens</i> (F.)
Tobacco flea beetle a.n.o.-----	<i>Epitrix parvula</i> (F.)
Tobacco moth a.n.o.-----	<i>Ephesia elutella</i> (Hbn.)
Tobacco thrips a.n.o.-----	<i>Frankliniella fusca</i> (Hinds)
Tobacco worm a.n.o.-----	<i>Protoparce quinquemaculata</i> (Haw.)

Tomato pinworm a.n.o.-----	Gnorimoschema lycopersicella (Busck)
Tomato psyllid-----	Paratrioza cockerelli Sulc.
Tomato worm a.n.o.-----	Protoparce sexta (Johan.)
Tropical fowl mite-----	Liponyssus bursa Berlese
Tropical rat mite a.n.o.-----	Liponyssus bacoti (Hirst.)
Tule beetle a.n.o.-----	Agonum maculicollis (Dej.)
Tuliptree scale a.n.o.-----	Toumeyella liriodendri (Gmel.)
Turkey gnat a.n.o.-----	Simulium meridionale Riley
Turnip aphid a.n.o.-----	Rhopalosiphum pseudobrassicæ (Davis)
Twig girdler a.n.o.-----	Oncideres cingulatus (Say)
Twig pruner a.n.o.-----	Hypernallus villosus (F.)
Two-lined chestnut borer a.n.o.-----	Agrilus bilineatus (Web.)
Unicorn caterpillar a.n.o.-----	Schizura unicornis (A. & S.)
Variegated cutworm a.n.o.-----	Lycophotia margaritosa saucia Hbn. (Changed to Peridroma margaritosa (Haw.))
Vegetable weevil a.n.o.-----	Listroderes obliquus Klug
Velvetbean caterpillar a.n.o.-----	Anticarsia gemmatilis (Hbn.)
Vetch bruchid a.n.o.-----	Bruchus brachialis Fahraeus
Walkingstick a.n.o.-----	Diapheromera femorata (Say)
Walnut caterpillar a.n.o.-----	Datana integerrima G. & R.
Walnut scale a.n.o.-----	Aspidiotus juglans-regiæ Comst.
Western pine beetle a.n.o.-----	Dendroctonus brevicornis Lec.
Western potato flea beetle a.n.o.-----	Epitrix subcrinita Lec.
Western spotted cucumber beetle a.n.o.	Diabrotica soror Lec.
Western striped cucumber beetle a.n.o.	Diabrotica trivittata (Mann.)
Western tent caterpillar a.n.o.-----	Malacosoma pluvialis (Dyar)
Western tussock moth a.n.o.-----	Hemerocampa vetusta (Bdv.)
Wheat jointworm a.n.o.-----	Harmolita tritici (Fitch)
Wheat stem maggot a.n.o.-----	Meromyza americana Fitch
Wheat stem sawfly a.n.o.-----	Cephus cinctus Nort.
Wheat straw worm a.n.o.-----	Harmolita grandis (Riley)
Wheat white grub-----	Phyllophaga lanceolata Say
Wheat wireworm a.n.o.-----	Agriotes mancus (Say)
White apple leafhopper a.n.o.-----	Typhlocyba pomaria McAtee
White-fringed beetle-----	Naupactus leucoloma Boh.
White-marked tussock moth a.n.o.-----	Hemerocampa leucostigma (A. & S.)
White peach scale a.n.o.-----	Aulacaspis pentagona (Targ.)
White-pine weevil a.n.o.-----	Pissodes strobi (Peck)
Willow-grove aphid-----	Melanoxanthium smithiae Monell
Winter tick a.n.o.-----	Dermacentor albipictus (Pack.)
Woolly alder aphid a.n.o.-----	Prociphilus tessellatus (Fitch)
Woolly apple aphid a.n.o.-----	Eriosoma lanigerum (Hausm.)
Woolly beech aphid-----	Phyllaphis fagi L.
Woolly elm aphid a.n.o.-----	Eriosoma americanum (Riley)
Woolly larch aphid-----	Chermes strobilobius Kltb.
Woolly maple leaf scale-----	Phenacoccus acericola King
Woolly whitefly a.n.o.-----	Aleurothrixus howardi (Quaint.)
Yellow-necked caterpillar a.n.o.-----	Datana ministra (Drury)
Zebra caterpillar a.n.o.-----	Manestra picta Harr. (Changed to Ceramica picta (Harr.))

